CLAY WORKING MACHINES

BREWER

H. BREWER & COMPANY

TECUMSEH, MICHIGAN

U. S. A.

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ESTABLISHED 1849

INCORPORATED 1900

CLAY WORKING MACHINES

BREWER

CATALOG No. 50

H. BREWER & COMPANY
TECUMSEH, MICHIGAN, U. S. A.

Introductory

As builders of Clay-Working Machines we need no introduction to the trade, for since 1849 we have been uninterruptedly engaged in that business. Within the last few years, however, our line has been so greatly enlarged that many of those who know us best are not informed as to the wide scope of our present operations.

That our early machines were good ones is most positively assured by the fact that a great many of them are still in satisfactory operation. We are proud of them; but the Brewer Machine of to-day represents all that was good of the older patterns combined with the increased capacity, weight, strength, and efficiency which fifty years of constant study and experiment have developed.

The purpose of this catalog is to supply information, to give details, and to furnish data which will assist an interested person in getting a definite understanding of what our machines really are, how they are built, what they will do, and why they are or are not adapted to certain requirements. To accomplish this purpose, descriptions of considerable length are sometimes necessary, but we are convinced that a prospective buyer is better satisfied with reasons why a machine is good than he is with that old, time-worn expression, ''the best,'' without any facts to substantiate it. And therefore, despite the possibility of making our catalog tiresome to the casual reader, we endeavor to make it useful to the person who bears the responsibility of making a satisfactory and profitable selection.

There are many who have given us loyal support and assistance during our fifty years in this business, and to them we again desire to express our sincere gratitude, feeling that we owe to them much of the credit for our success and advancement. We will certainly endeavor to merit their cooperation in the future, and will continue unswervingly in the policy of fair treatment to all—good, well-built machines; and prices as low as possible consistent with proper material, construction, and workmanship.

H. BREWER & COMPANY
TECUMSEH, MICHIGAN

Repairs

The nature of Clay-Working Machines is such that it is impossible to avoid the necessity of replacing the parts subject to wear, no matter how well the machine may be built or how careful the operator. We therefore carry in stock at all times ready for instant shipment a stock of standard repair parts intended to cover every possible requirement of any machine we have ever put out.

Orders for repairs which specify the number of the parts required are the least liable to be misunderstood, but in cases where it is inconvenient to determine the number, a description of the part stating where upon the machine it is used, will answer. When the machine is a very old one, or in cases where it was not purchased direct from us, the name of the original purchaser or at least the name of the previous owner will assist us in locating it in our records and facilitate dispatch in filling repair orders.

Always state whether the shipment is to be made by freight or express. If not stated, we will forward in the manner which involves the least expense.

Brewer Horizontal Brick Machines

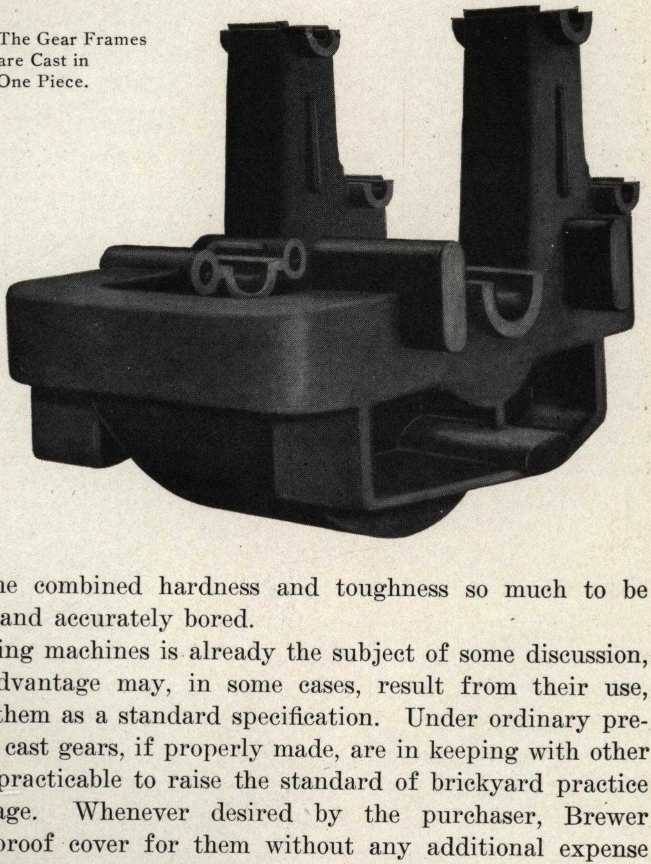
A detailed description of the design and construction which applies equally to the three sizes, illustrations and specifications of which are shown upon the following pages

TO fully comprehend the excellent design and construction of Brewer Horizontal Machines, a careful study of the details is necessary, and therefore in the paragraphs which follow special effort is put forth to bring out those details as clearly as possible without leading the brick machine user farther than he is capable of going with a good, clear understanding into the field of the brick machine builder.

It would be easier to say that these machines are absolutely the best on earth and let it go at that, but especially to a person not acquainted with the builders such a statement might have no weight whatever. It seems better, therefore, to definitely and clearly show the reasons why the machines are superior, by separating them into their principal parts and in each case bringing out the important points.

The Gear Frames

From the illustration herewith the design and construction of the gear frame is at once apparent. It shows the rough casting as it comes from the foundry and gives a clearer idea of the strength and weight of the part than would be possible to convey by use of words. It is common practice to build these frames in two or more pieces, depending upon the skids of the machine and such struts and staybolts as may be conveniently interposed for a mechanical connection between them; but a permanently rigid frame has never been built in that manner, and therefore the design shown herewith, cast in one piece, with a heavy semi-cylindrical web connecting the two members, is offered as something superior to any similar part produced at the present time. Every stress of tension, compression, torsion or flexion is resisted by a liberal amount of metal, properly distributed, and under the most extreme working conditions to be realized it can not break, spring, or even vibrate.


The Gear Frames are Cast in One Piece.

The Gears

The very highest grade of cast semi-steel gears are employed upon all sizes of these machines. They are made from machine-cut patterns in our own foundry, where the production of such parts has been reduced to a science, both in moulding and in providing a mixture of metals which yields the combined hardness and toughness so much to be desired. They are all extra heavy, well proportioned, and accurately bored.

The question of machine-cut gears for clay-working machines is already the subject of some discussion, and while it is generally admitted that considerable advantage may, in some cases, result from their use, machinery builders have not seemed ready to adopt them as a standard specification. Under ordinary prevailing brickyard conditions at the present time, the cast gears, if properly made, are in keeping with other methods employed in such cases; but it is eminently practicable to raise the standard of brickyard practice to a point where cut gears would be a decided advantage. Whenever desired by the purchaser, Brewer Machines will be supplied with cut gears and a dust-proof cover for them without any additional expense save that actually involved in the substitution, thus leaving the matter to be decided according to the circumstances which may surround any particular machine.

The Bearings

The bearings are all of the capillary self-oiling pattern, and require attention only about once in two weeks. The connection between the reservoir, with which each journal is supplied, and the bearing surface is not made with wicking, waste, or anything of that sort, but all the oil which passes into the journal is thoroughly filtered. The oil reservoirs are fitted with self-closing lids, and wherever practicable the ends of the journals are blind-babbitted to make the bearing as nearly grit-proof as possible. All box caps are recessed into the frame and are secured in position by steel cap-screws, which pass through drilled holes. Liberal length is allowed each journal, and only high-grade bearing metal is used for the babbitting, which is done with suitable appliances to insure proper alignment.

The Back-Thrust Bearings

The back-thrust bearings consist of two chilled- iron plates, ground to perfectly flat surfaces, running together in an oil reservoir which is separate from the gear-frame and attached to it by two very heavy bolts. These bolts not only take all the backward pressure of the pugging shaft, but provide a means of easily moving the shaft ahead as wear occurs upon the expressing screw and liner; thus serving to maintain those parts up to their maximum efficiency throughout their life by keeping them close together, as they should be, and preventing the clay from slipping back over the edges of the screw blade. In short, the back-thrust bearings are self-aligning, self-oiling, independent, and adjustable, with all parts easily accessible when necessary, but at all times tightly covered to exclude dirt and grit.

The Pugging Cylinders

The pugging cylinders are made up of two parts machined and bolted together, also machined to the gear frame and attached thereto by means of six heavy studs set in the frame to register with drilled holes in the cylinder. The interior of the cylinder is ribbed laterally to prevent rotation of the clay with the shaft; also around the circumference to prevent back feeding. The upper half of the cylinder combines the feed roll casing and hopper, all cast in one piece, with suitable provisions for attaching the tackle hooks necessary for handling such parts.

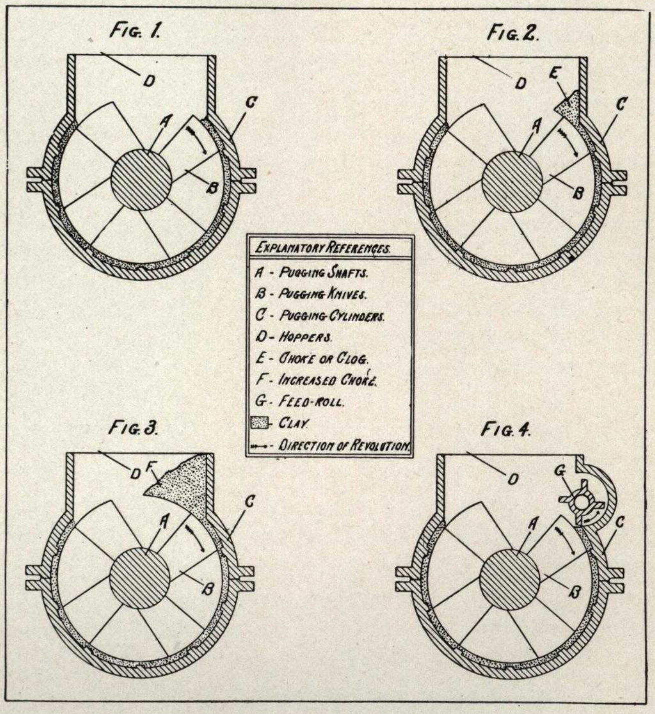
The Pugging Shafts

The pugging shafts are made of semi-steel; are finished throughout the entire length, and range from 5 inches to 9 inches in diameter for the different sizes. (See specifications.) The pugging knives are mortised into the shaft and are held in position by taper keys. This form of construction provides a pugging arrangement which is easily adaptable to different clays and circumstances, and which is subject to a movement through the clay with the least power compared with the amount of work accomplished.

The Pugging Knives

The pugging knives are forged from hard, high-carbon steel, resembling somewhat the shape of a butcher's cleaver, one inch thick at the back and tapering to a comparatively sharp edge. The shanks are round, fitting easily into round holes in the shaft with taper keys to hold the knife in the desired position. This method is much superior to any of the others employed for a similar purpose; for instance, the practice of attaching knives to the shaft with bolts is objectionable on account of the fact that the knife shanks, bolt-heads, and nuts all present very rough surfaces to the body of clay in the machine, which cuts down the efficiency and demands more power to rotate the shaft. Further, knives which have solid eyes have to to be strung upon the shaft, and to remove one of them requires not only the removal of others, but frequently the shaft itself has to be taken out of the machine. Inspection of a machine which has been run a short time readily shows the relative efficiency of the two methods. In one case the pugging shaft will be surrounded with a wad of clay extending throughout its length, while with the forged knives described above it will be found that they have been working clear down to the shaft, and that the shaft itself is polished bright, all of which indicates maximum work with minimum power. Another point in favor of the method described above is that the pitch of the knives may be readily changed when desired, and that the whole knife may be set out from the shaft as the outside edges wear off; thus giving about twice the service possible with other forms of construction.

The Feed Rolls



As far as this line of horizontal brick machines is concerned, the term "feed roll" is a misnomer, for it is not a roll and does not feed. The device gained its name through previous attempts to use a roll for the purpose of keeping the hopper clear of an accumulation of clay and a consequent stoppage of the feed, but on account of clogging, causing excessive friction between the roll and its casing, the device has been abandoned. The necessity for it still remains, however, as will be seen by the sketches herewith. Fig. 1 shows a cross-section of a pugging cylinder and hopper with the wall or layer of clay around the interior as it is before choking begins, and Fig. 2 illustrates how the knives, revolving in the direction indicated by the arrow, are continually leaving particles of clay upon the edge of this wall until it gets into the condition shown by Fig. 3 when the opening of the hopper is much contracted and the feeding proportionally interrupted. In Fig. 4 the Brewer Feed Roll is shown in connection. It revolves in the direction indicated by the arrow, being driven from the pugging shaft by gears, and on account of its cruciform shape, does not clog or heat. It keeps the hopper clear all of the time, assures a constant feed, materially increases the efficiency of the machine, and requires very little power to drive. It is tightly encased to prevent leakage, and is easily replaced when worn.

The Screw Cases

The screw cases or nozzles are machined and rigidly bolted to the cylinder. They are provided with removable liners which take the wear and are easily replaced when necessary.

The Screw Case Liners

The screw case liners are made of white iron corrugated laterally throughout the interior surface. The exterior is surrounded by a steam jacket by means of which the clay in the corrugations may be kept dry and hard for the purpose of creating a still closer casing for the screw. The object of this method is to prevent the clay, as it is being forced ahead, from turning with the screw or slipping back over the blades of it, thus confining the pressure to the die, increasing the output, and decreasing the power requirements.

The Expressing Screws

The expressing screws are made of white iron, a material which combines to the greatest possible extent the features of hardness and strength which are necessary for such parts. The shape is determined by the results of experiments involving hundreds of different patterns and extending over a period of nearly fifty years, and they show a higher efficiency than any other patterns now in use. To provide for clays of other than ordinary nature or for the production of ware having uncommon dimensions or shape, special patterns of screws are available which correspond with the peculiarities of the case.

Through the adjustable features of the back-thrust bearing, mentioned elsewhere, the wear which occurs upon the screw and the liner may be easily taken up and those parts kept closely fitting one another. In this way the service to be obtained before renewal is necessary is greatly increased and the operating expense reduced to a minimum.

The Hinge Fronts

In the design of all other parts of the machine the necessary strength and weight have been provided to concentrate as thoroughly as possible all the applied power to the die, and liberal safety factors have been introduced to insure the stability of the machine as a whole. It frequently happens, however, that dry clay, stones, or similar unintended substances get into the machine through accident or carelessness, and then, if there is driving power enough, something must break. The hinge fronts, therefore, are provided with safety latches, strong enough to withstand any stress which should be safely applied without danger to other parts, but weak enough and inexpensive enough to be broken in time to prevent damage to other parts. In this case the safety device consists of any ordinary machine bolt of proper size, duplicates of which can be readily obtained at an ordinary hardware store anywhere. The parting of the safety bolt is not liable to cause injury to adjacent parts, and the arrangement of the latch is such that it may be readily disengaged even while heavy pressure is against it.

The Outboard Bearings

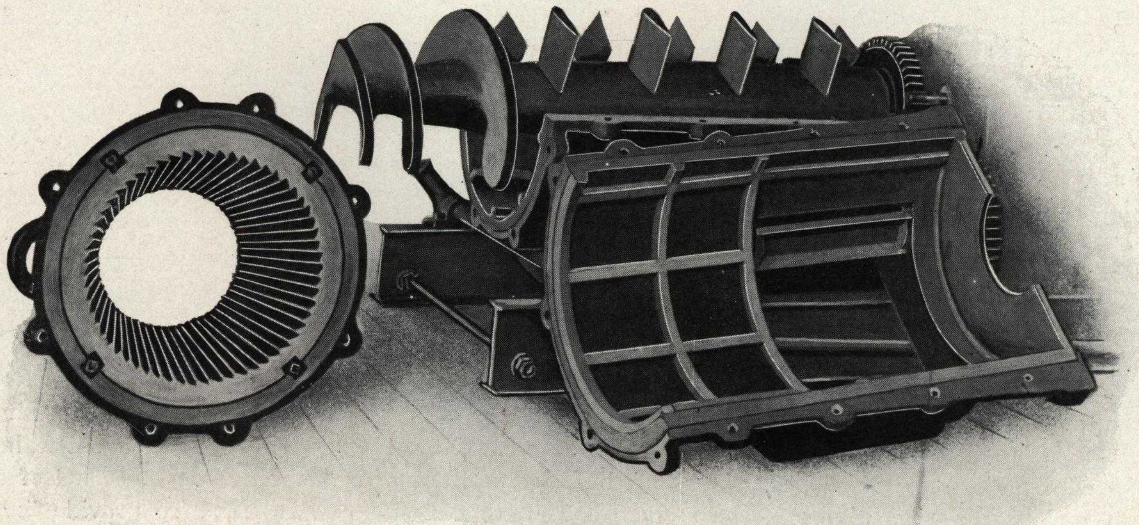
The outboard bearings for driving shafts are mounted upon the same I-beams which connect the other parts, thus making the machines entirely self-contained and only one foundation necessary.

The Driving Pulleys

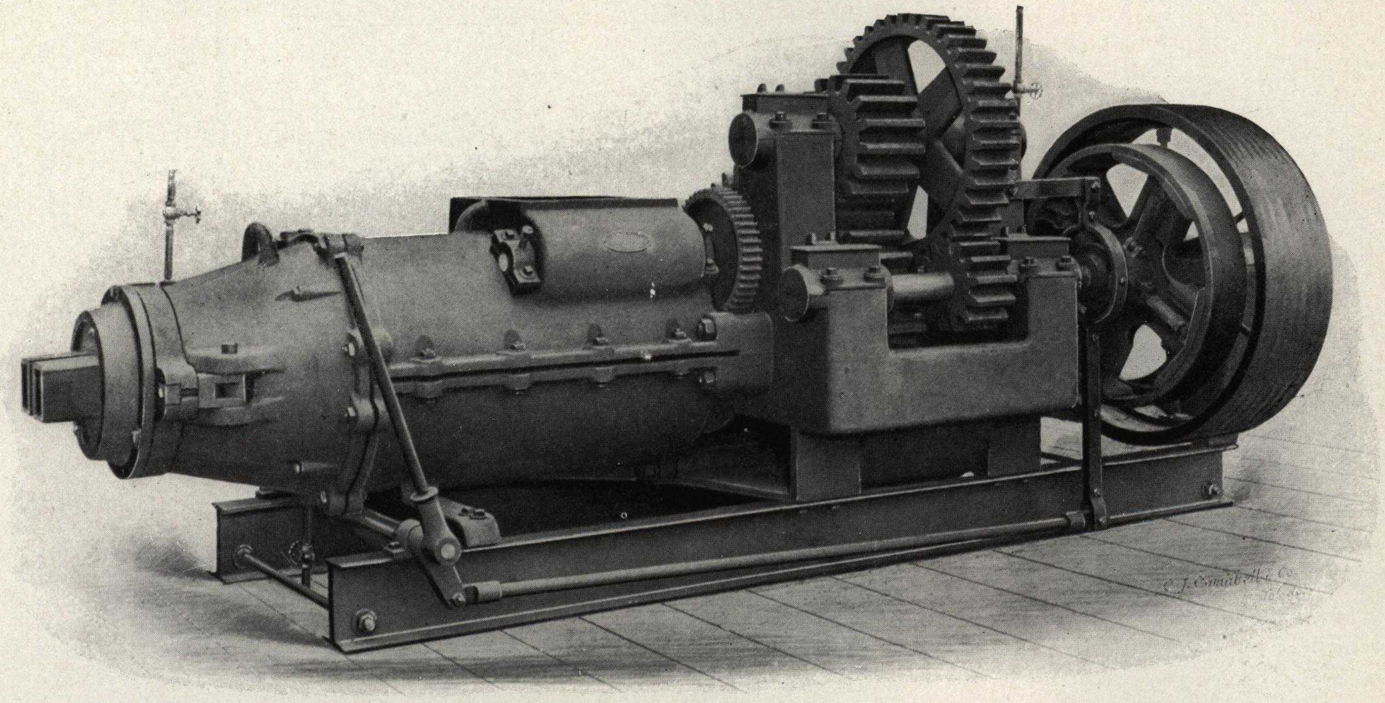
The driving pulleys are all of the friction-clutch pattern, the Type C, 4-arm clutch being furnished with the No. 25 and larger models, and the Type B, 2-arm clutch with the No. 24 and smaller machines. Both patterns are easily capable of transmitting double the power required of them and include all features of adjustability to take up wear and interchangeability of parts. Shoes are provided with hardwood soles and bushings lubricated with automatic compression grease cups.

The Capacity

In rating the capacity of the several different sizes of these horizontal machines the unfavorable conditions which will frequently surround them have been taken into consideration. With an easy-running clay, well tempered and regularly fed, any of them will produce fully double the output named in the specifications, and under any ordinary conditions which should be present in a well-conducted establishment the ratings given are those which the machines will actually produce with ease and safety. In other words, the ratings are very conservative and may be depended upon without danger of disappointment.



View of the Interior Working Parts



The No. 25 Horizontal Brick Machine

FROM the illustration, and the specifications given below, an accurate idea of this machine and its capacity may be obtained. All dimensions are faithfully stated, and the weight noted is actual, as shown by the scales, not ''estimated'' or ''about'' so many pounds.

A capacity of 5,000 standard size brick per hour is guaranteed, but the actual amount of work the machine is capable of doing is much more than that under any ordinary conditions. There is, however, a great difference in the materials and methods and the rating given is intended to cover extreme cases.

Upon the pages next preceding will be found a complete description of the design and construction of all these horizontal machines. It brings out many valuable features and touches upon points concerning which the prospective purchaser should be informed.

Specifications

Weight—11,970 pounds.
Length—Over all, 12 ft. 6 in.
Width—Over all, 5 ft. 11 in.
Height—Over all, 5 ft. 2½ in.
  From bottom of I-beam to top of hopper, 3 ft. 5½ in.
Shafts—Driving, 3 in. diameter, steel.
  Pugging, 8 in. diameter, semi-steel.
  Intermediate, 3½ in. diameter, steel.
  Feed roll, 2 in. diameter, steel.
Gear—First reduction, 6 in. face, 2¼ in. pitch, semi-steel.
  Second reduction, 8 in. face, 2¾ in. pitch, semi-steel.
  Feed roll, 2½ in. face, 1 in. pitch, semi-steel.

Journals—12 in. long, self-oiling.

Outboard Bearing for pulley shaft mounted on same I-beam as balance of machine.

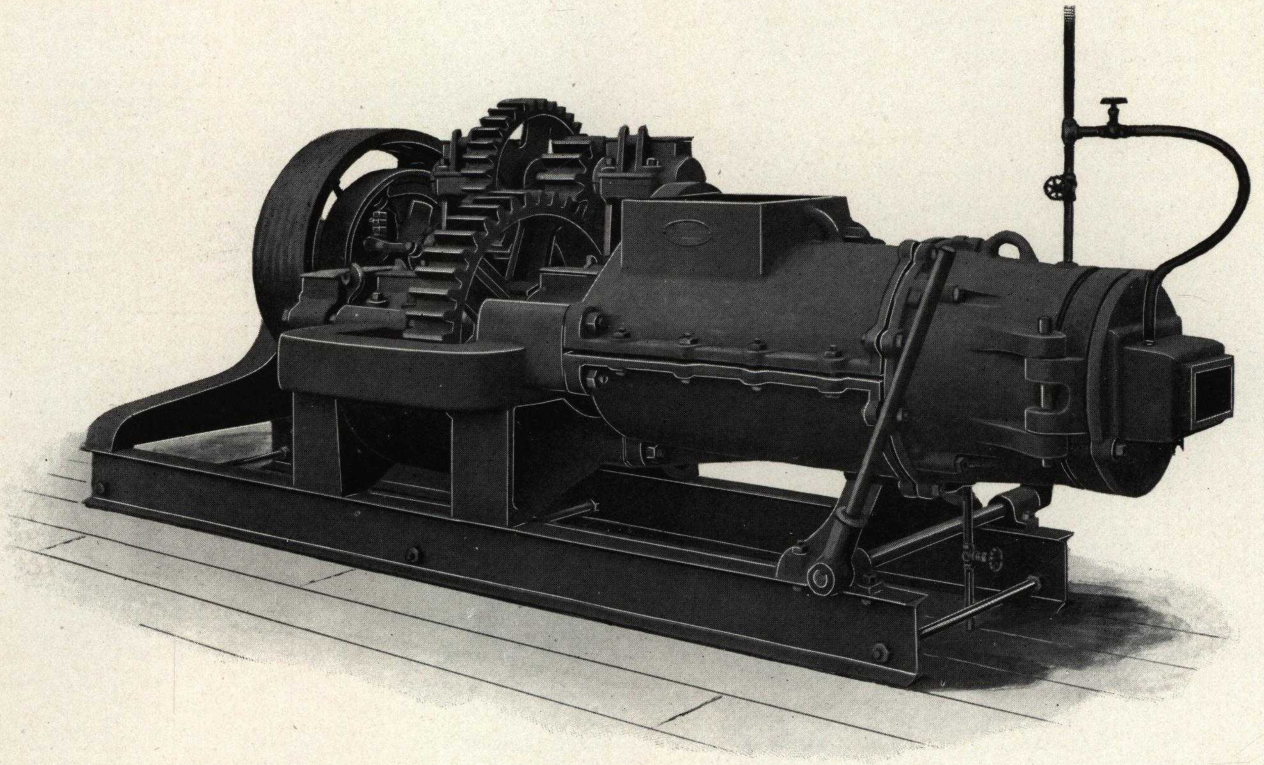
Driving Pulley—Friction clutch, type C, 42 in. diameter, 12 in. face.

Motor Drive—The machine can be driven by electric motor without reconstruction.

Speed of Driving Shaft—275 to 300 revolutions per minute.

Direction of Revolution—As observer faces the die driving pulley runs *over* from *left* to *right*.

Capacity—5,000 standard size bricks per hour.



The No. 24 Horizontal Brick Machine

ALTHOUGH smaller in size and lighter in weight, this machine is as strong, large, and heavy in proportion to its capacity as the larger sizes. Its design and construction are identical with that entering into the No. 25 machine, and the same liberal factors of safety are allowed in the proportions of all its parts.

In giving this size a guaranteed capacity rating of 3,000 bricks per hour, the various unfavorable conditions which will in some cases attend its operation are taken into consideration, and therefore the rating may be considered perfectly safe under any circumstances which may be present with ordinary working conditions.

The specifications given below are exact, and to be depended upon. The weight is not "estimated" or calculated, but is the actual scale weight which the buyer is entitled to. See general description upon preceding pages.

Specifications

WEIGHT—7,300 pounds.

LENGTH—Over all, 11 ft, 3 in.

WIDTH—Over all, 4 ft. 8 in.

HEIGHT—Over all, 4 ft. 2 in.
From bottom of I-beam to top of hopper, 3 ft. 3 in.

SHAFTS—Driving, 2½ in. diameter, steel.
Pugging, 6½ in. diameter, semi-steel.
Intermediate, 3 in. diameter, steel.
Feed roll, 2 in. diameter, steel.

GEARS—First reduction, 4⅛ in. face, 1¾ in. pitch, semi-steel.
Second reduction, 6 in. face, 2¼ in. pitch, semi-steel.
Feed roll, 2½ in. face, 1 in. pitch, semi-steel.

JOURNALS—12 in. long, self-oiling.

OUTBOARD BEARING for pulley shaft mounted on same I-beams as balance of machine.

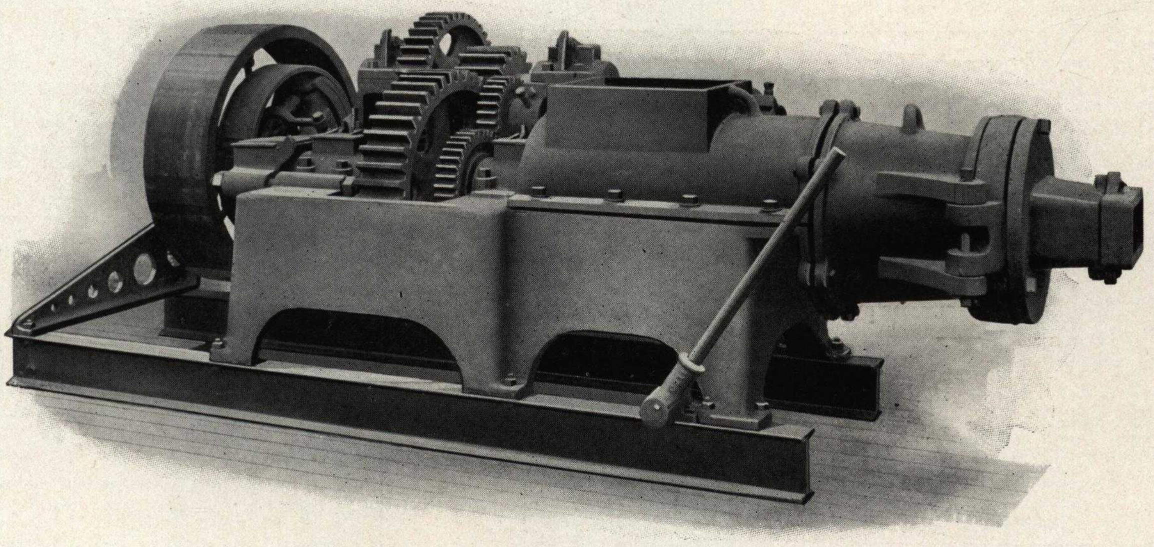
DRIVING PULLEY—Friction clutch, Type B, 34 in. diameter, 10 in. face.

MOTOR DRIVE—The machine can be driven by electric motor without reconstruction.

SPEED OF DRIVING SHAFT—250 to 275 revolutions per minute.

DIRECTION OF REVOLUTION—As observer stands facing the die, driving pulley runs *over* from *left* to *right*.

CAPACITY—3,000 standard size bricks per hour.



The No. 23 Horizontal Brick Machine

THIS is the smallest size of the line, but no details of design or construction have been sacrificed on account of its size. It is proportionally identical with the larger models except that the gear frame and lower half of the pugging cylinder are cast together in one piece, which may be considered an advantage. In all other respects the general description upon the foregoing pages applies to every detail of this size, and from the specifications below it will be observed that all proportions are generous with liberal factors of safety.

It is desired to impress upon the reader that the rating of 2,000 bricks per hour capacity which is given this machine is a perfectly safe estimate even when taking into consideration average conditions, both favorable and unfavorable, which are generally present in actual practice. The machine is not claimed to be a large one, but it will perform with ease and safety the amount of work specified.

Specifications

Weight—4,800 pounds.

Length—Over all, 9 ft. 6 in.

Width—Over all, 4 ft. 2½ in.

Height—Over all, 3 ft. 7 in.
  From bottom of I-beam to top of hopper, 3 ft.

Shafts—Driving, 2½ in. diameter.
  Pugging, 5 in. diameter, semi-steel.
  Intermediate, 2⅞ in. diameter, steel.
  Feed roll, 2 in. diameter, steel.

Outboard Bearing for pulley shaft mounted on same I-beams as balance of machine.

Journals—9 in. long, self-oiling.

Gears—First reduction, 4 in. face, 1⅜ in. pitch, semi-steel.
  Second reduction, 5½ in. face, 1¾ in. pitch, semi-steel.
  Feed roll, 2½ in. face, 1 in. pitch, semi-steel.

Driving Pulley—Friction clutch, type B, 34 in. diameter, 8 in. face.

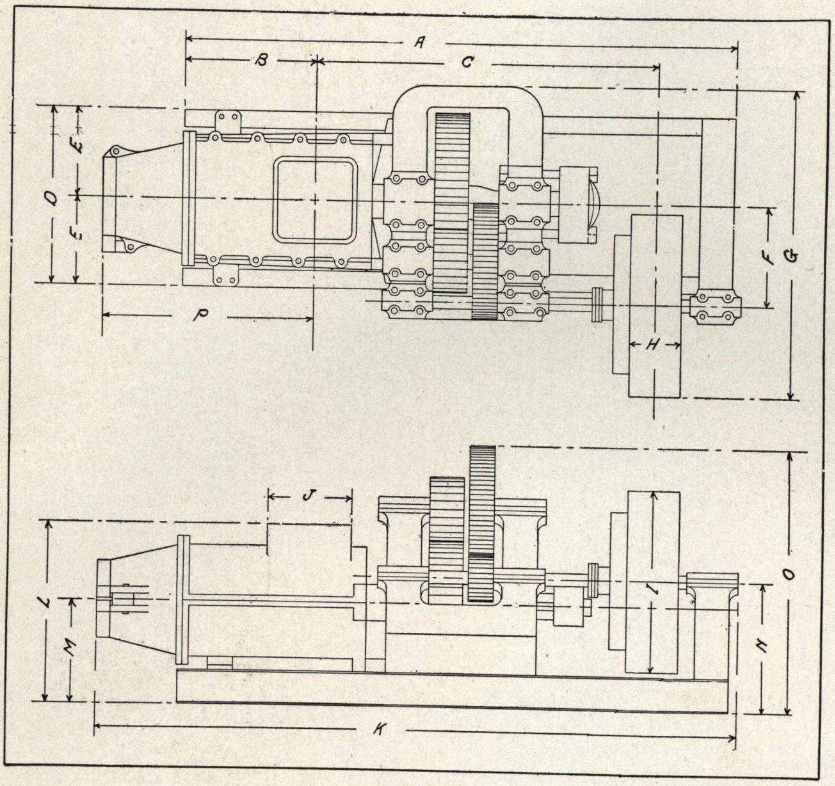
Motor Drive—The machine can be driven by electric motor without reconstruction.

Speed of Driving Shaft—225 to 275 revolutions per minute.

Direction of Revolution—As observer stands facing the die, the driving pulley runs *over* from *left* to *right*.

Capacity—2,000 standard size brick per hour.

Brewer Horizontal Brick Machines



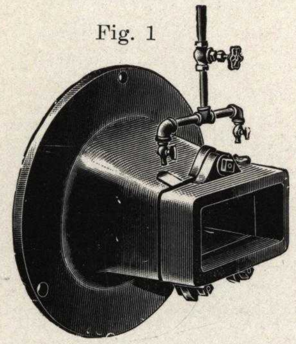
GENERAL DIMENSIONS OF ALL SIZES

	DIMENSIONS IN INCHES		
	No. 25	No. 24	No. 23
A	132	120	96
B	34½	29	22
C	80½	76	62⅜
D	41	31½	30
E	20½	15¾	15
F	22⅝	19	18½
G	71	56	50½
H	12	10	8
I	42	34	34
J	18	15¾	15¾
K	149	135	114
L	41½	39	36
M	24	24	24
N	30¼	29	24
O	63	50	43
P	49	42½	36¼

Brick Dies

THE work expected of a brick die is the formation of a column of clay which will have certain specified dimensions and an even, homogenious texture throughout. This purpose is accomplished more or less effectively by hundreds of different methods incorporated into brick die designs, and three of those methods enter into as many different patterns of Brewer brick dies which have, during fifty years of experience, proved equal to all occasions. A very large number of Brewer dies will be found upon machines of other manufacture, which alone is a high recommendation of their efficiency, as there is scarcely another pattern which one of the three described below has not displaced under some of the unfavorable conditions which present themselves in the clay-working business.

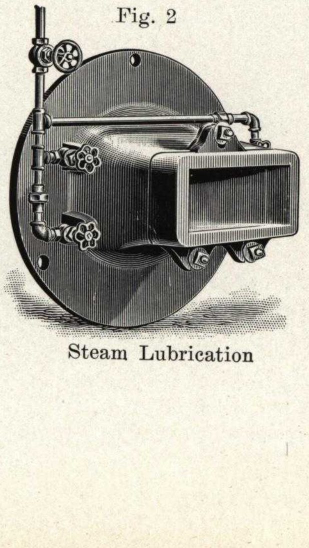
Fig. 1



Water Lubrication

The Water Lubricating Die, illustrated by Fig. 1, is the pattern recommended for the great majority of cases where side-cut bricks are to be made. It is of simple and durable construction, not expensive to maintain, and moulds a good column of even texture from almost any clay suitable to be made into bricks. It has no complicated liners which wear out quickly and are expensive to replace, but is made up of castings, the interior surfaces of which are thoroughly chilled and finished by special machinery. The design consists of a large forming die, to the front of which is attached a small finisher or slicker with slots between the two through which the water for lubrication enters and discharges, leaving the column smooth, dry, and in excellent condition for handling. The shapes of these parts are such that

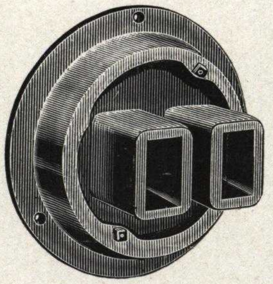
Fig. 2



Steam Lubrication

the portions of the column subject to the least resistance during formation, and consequently inclined to issue more rapidly, are retarded; while the corners, which, on account of the greater surface of contact and proportionately increased friction, tend to issue more slowly, are lubricated with water to overcome the resistance and accelerate their issue to a speed equal to that of the balance of the column.

Fig 3

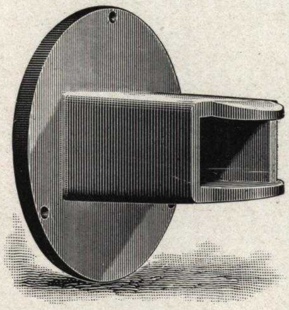


Dry
Double Stream End Cut

The Steam Lubricating Die, illustrated by Fig. 2, is of the same form and construction as far as general points are concerned as the die described above; but instead of lubricating with water between the die and slicker, jets of steam or condensed steam under pressure are directed against the corners of the column just as they are being formed in the rear part of the die. These steam jets are subject to independent regulation, so that as much or as little lubricant may be applied at each corner as may be necessary to make all parts of the column issue at the same speed. The column, having been roughly formed by the die, is finished by the slicker, which perfectly squares the corners and smooths and dries the faces without further lubrication, while the surplus lubricant is discharged through the bottom of the slot, leaving the column in excellent condition to be cut and handled. It is possible with this die to use both steam and water lubrication if desired, but such practice is not called for except in very rare cases, if at all.

The Dry Die, illustrated by Fig. 3 and Fig. 4, is the most simple of all, and has a great many points in its favor, particularly in the case of end-cut brick, when the style shown in Fig. 3 is especially recommended. All dry dies require an even temper of the clay being molded, to produce the best results; but although this requirement is perhaps a little less imperative with other patterns, it is a condition to be desired for other reasons than the satisfactory operation of the die, and therefore can not be considered an objection. In this pattern an even flow, or issue, of the column is secured by shaping the interior surface according to circumstances.

Fig 4



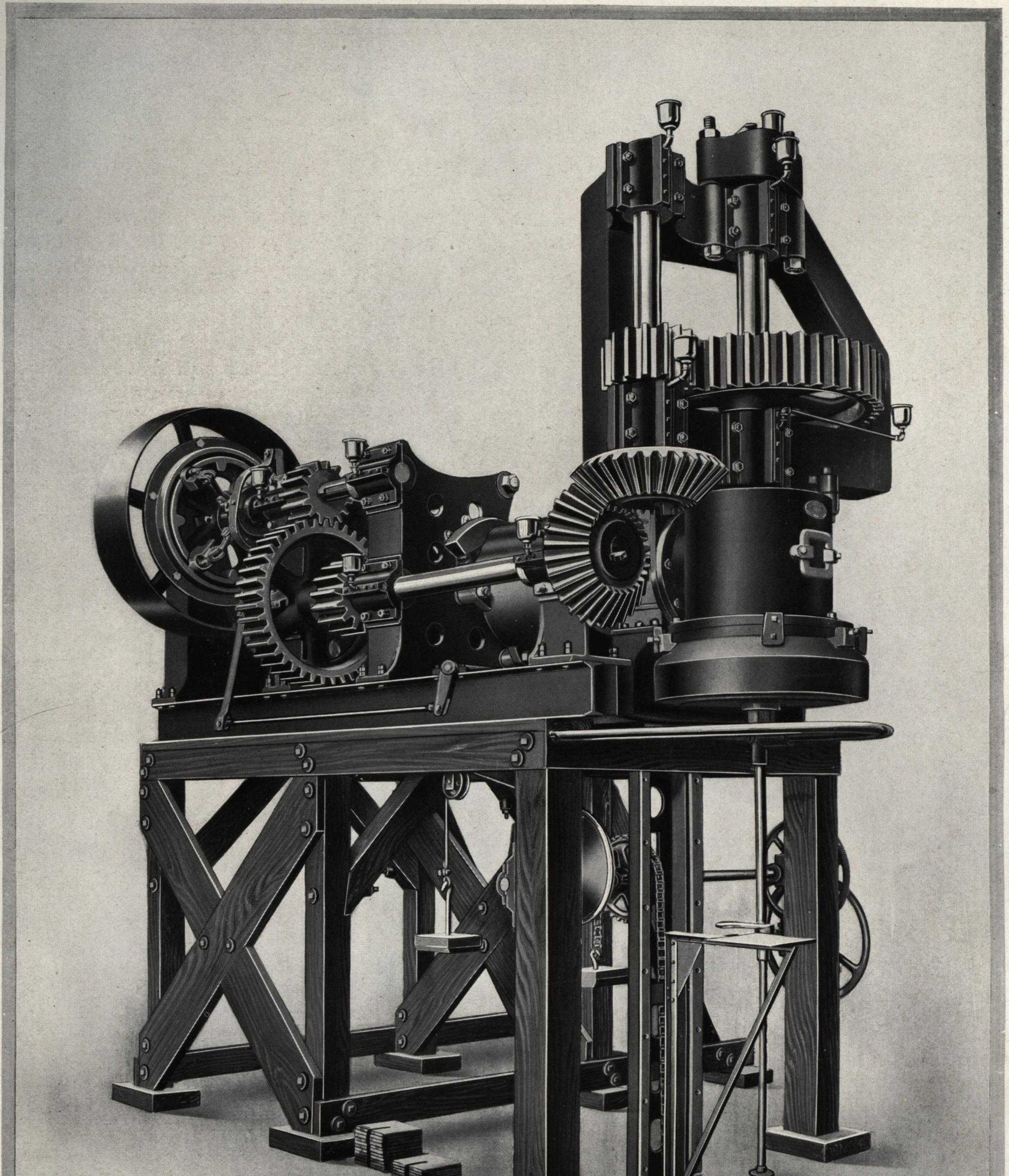
Dry

The great variety of sizes required makes it practically impossible to carry brick dies in stock for immediate shipment. They are therefore made to order after specifications are received, and sufficient time must be allowed to cover the making of patterns, chills, castings, etc., which are required to produce a die of any given size or kind. Orders should specify the pattern desired, the dimensions of the column to be molded, and the name and number of the machine upon which it is to be used. If the machine is of other than Brewer manufacture, the order or the request for quotations should be accompanied by a stiff paper template showing the size and shape of, also the size and location of the bolt holes in the front of the machine upon which the die is to be used. The template should be so marked that it will show which is the top side; and the distance from the front of the front auger or expressing screw to the part of the machine which the template represents should be written upon it, together with the name and address of the sender.

Standard Size Brick

THE National Brick Manufacturers' Association in 1893 established a standard size for a hard-burned, common building brick, at 8¼ x 4 x 2½ inches, and in 1899 reaffirmed those dimensions. Since that time, however, other local associations and the legislatures of some states have established different dimensions, and therefore it is impossible to state that there is any universal standard in this country. There are, however, certain relative dimensions which every common building brick should have in order to lay up and bond properly in the wall, and the following proportions should always be observed: The length of the brick should be equal to twice the width plus the thickness of a mortar joint, whatever it may be.

It should be remembered, however, that all of the above refers to the dimensions of the burned brick and not to those of the die or mould used to produce it. To arrive at the proper dimensions of the latter, the upset of the column (if any) after it leaves the die and the shrinkage in drying and burning must be considered.



No. 79 Down Delivery Drain Tile Machine

No. 79 Down Delivery Drain Tile Machine

FOR the production of the larger sizes of straight pipe and drain tile from 12- to 24-inch inclusive, the Down Delivery Machine has a great many advantages over the horizontal delivery machine or the steam-press. As compared with the horizontal delivery machine, it produces larger sizes of tile and eliminates the tendency of all sizes to flatten as they issue. It permits a softer temper of the clay without danger of the tile losing their shape and makes it possible to use clays for the larger sizes which otherwise would not be of sufficient strength. It is also more rapid on account of the fact that the tile do not have to be dumped after cutting.

Compared with the steam-press, the Down Delivery Machine costs less, is more rapid in proportion to its size and cost, can be operated with two less men, and as the column of tile issues continuously, the machine is easier to feed than the press which requires intermittent feeding.

The features of design connected with this particular model which place it in a class by itself are as follows: It is enough heavier than required by most extreme service to be proof against breakage. It is self-contained, having a heavy cast sub-base between, but independent of the I-beams to which all of the different members are machined and rigidly attached, and is therefore not dependent upon the I-beams or upon the foundation for its alignment. It has separate feeding and expressing screws working in a manner similar to that followed in Brewer Upright Machines for fifty years. It is supplied with the roller feeder which is in use upon all Brewer Horizontal Machines (see page 5) for the purpose of keeping the hopper clear. The cores of the dies are held in the same manner as upon Brewer Upright Machines without bridge or bracket (see page 16), or if desired, a bridge may be used in cases where the nature of the clay will permit. The cut-off table, when loaded, is balanced at all points, and is operated with minimum effort.

The construction is high-grade throughout. All augers and expressing screws are of white-iron; all gears of semi-steel, cast as a standard specification or cut if desired by purchaser at a proportional advance in price. The bearings are all self-oiling, provided with individual reservoirs, but easily piped to a large single reservoir if desired. Thrust bearings, self-aligning and adjustable.

Specifications

WEIGHT—17,500 pounds.

LENGTH—Over all, 13 ft.

WIDTH—Over all, 6 ft. 10 in.

HEIGHT—Over all, ~~7~~ 6 ft. 10 in.
  From bottom of skid to top of hopper, 3 ft.
  Of necessary supporting framework, ~~6~~ 5 ft.

SHAFTS—Driving, 3½ in. diameter.
  Intermediate, 4 in. diameter.
  Horizontal feed, 4 in. diameter.
  Outside vertical feed, 4 in. diameter.
  Vertical expressing, 5 in. diameter.
  Core rod, 2 in. diameter.
  Core stem, 3 in. diameter.

GEARS—First reduction, spur, 7 in. face, 2¼ in. pitch.
  Second reduction, spur, 7½ in. face, 2½ in. pitch.
  Second reduction, mitre, 6½ in. face, 2¼ in. pitch.
  Third reduction, spur, 7½ in. face, 2½ in pitch.
  Feed roll, 2½ in. face, 1 in. pitch.

JOURNALS—10 in. long, self-oiling.

DRIVING PULLEY—Friction clutch, Type F, 45 in. diameter, 12 in. face.

MOTOR DRIVE—If so specified, suitable gears for motor drive will be substituted for Friction Clutch and pulley without advance in price.

SPEED OF DRIVING SHAFT—~~200~~ 125 revolutions per minute.

DIRECTION OF REVOLUTION—Top of pulley runs *from* the machine.

Brewer Drain Tile and Hollow Block Machines

A general description which applies to the design and construction of all sizes

BECAUSE a machine is efficient in the production of brick, or other forms of clay ware, the dies for which offer comparatively little resistance to the issue of the column, it does not necessarily follow that the same machine will be efficient in the production of drain tile, hollow blocks, or such wares which require dies of much greater resistance. On the other hand, a machine which will produce the smaller sizes of drain tile and hollow blocks with efficiency will also produce brick with efficiency, but on account of the difference in the resistance of the dies certain features are necessary with a drain tile machine which are not required with a brick machine, and for that reason vertical or upright patterns are recommended for tile and hollow ware, while the horizontal pattern is used for brick.

About fifty years ago the first drain tile machine offered to the American market was built in the Brewer shops. It was a great success, and during the following years hundreds of machines of the same pattern were placed in operation throughout the United States and Canada, some of which are running to-day, giving satisfactory service to the users. It was not long, however, before the market indicated the need of not only machines of larger capacity, but those which would produce larger sizes of tile, and consequently improvements upon the original pattern were commenced early in its history and have continued without interruption up to the present time.

The Upright Drain Tile and Hollow Block Machines shown in this catalog are all reconstructions of older patterns in which time and experience have developed every weak point, and they are so far beyond the experimental stage that their capacity, efficiency, and reliability are unquestioned. They have been designed with a full knowledge of the work expected of them, and with a determination to produce a high-grade machine without regard to any reasonable cost.

The advantages coming directly from the upright or vertical type of construction are many and of great consequence. First: The efficiency of the auger or expressing screw is nearly doubled by the forced feed of the knives on the vertical shaft; that is, compared with horizontal drain tile machines, the greater amount of clay in the upright machine and under pressure at all times not only keeps the expressing screw full, but, on account of the pressure, nearly doubles the efficiency of the screw. Cases are known where an auger or expressing screw in an upright machine delivers the same amount of ware when running at 30 revolutions per minute as a screw of the same diameter and pitch working the same clay in a horizontal machine at 60 revolutions per minute. At the same time this greater amount of clay provides a sufficient reserve supply to make up for irregularities in feeding the machine as well as differences in the temper of the clay which occur to a greater or less extent under best of conditions. The results gained in these directions are greater output in proportion to the power expended and a uniform speed of delivery, which assist in the economical handling of the product.

Second: This type of construction permits the use of a very short auger or expressing screw, which requires a correspondingly short projection of the auger shaft beyond its bearings and makes it possible to hold the cores of the tile dies upon the end of the shaft without the use of any spider, bridge, bracket, or other core supporting device. At the same time the spider or bridge may be used with the upright machine in any case where it can be used with any other machine and still retain a degree of efficiency which has never been gained by anything except the upright pattern. Both methods of supporting the cores of tile dies are illustrated and described upon succeeding pages, to which attention is especially directed.

Third: In cases where the spider, bridge, or other core supporting device is avoided it is possible to locate the tile dies much closer to the auger or expressing screw, thereby decreasing the amount of power required to drive the machine and producing a superior grade of ware free from the tendency, present with the majority of surface clays, to crack or check lengthwise along the lines of the spider arms.

Fourth: At the point where the clay is changed from a downward to an outward direction just before it is expressed through the die, the structure of the mass is broken up and reformed, which not only has a great pugging effect, but improves the quality of the ware produced and affords an opportunity for the escape of air confined in the clay, which would otherwise remain and cause blisters upon the finished product.

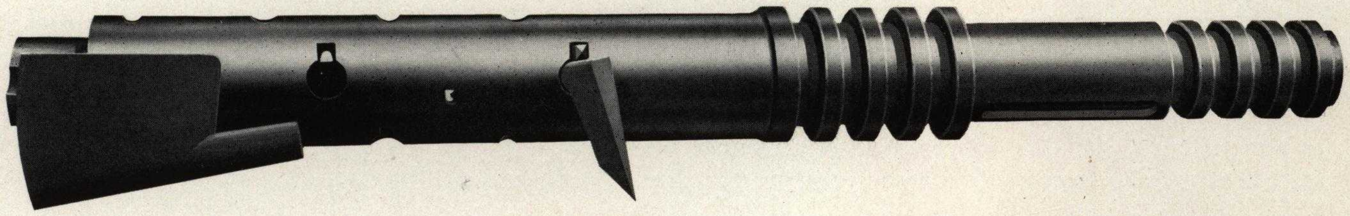
Fifth: The pugging capacity of the upright machine as a whole is very great, and in cases where the clay is tempered at the bank or by similar methods the vertical portion of the machine may be considered as equal in effect to a six-foot pug mill. This may also be considered as an advantage in larger plants where pug mills are used in addition, for the pug mills may be smaller and shorter.

This line of Upright Machines consists of three sizes, illustrations and complete specifications of which will be found on the succeeding pages. The design and construction of all sizes is the same in every particular except where differences are necessary on account of size, and the following paragraphs, describing the details of design, apply to any machine of the entire list.

The Pugging Cylinder, including all of the vertical portion of the main frame, is cast in one piece instead of two or three pieces bolted together as in earlier practice. This provides a rigid construction impossible to attain in any other manner, and preserves the alignment of the pugging shaft without any bearing in the clay at its lower end. Openings at suitable points with easily removable covers allow ready access to the knives upon the pugging shaft, and the interior surface is corrugated to prevent a rotary motion of the clay or "back feeding."

The Gear Frame is also a one-piece casting, much heavier and stronger than previously used, and provides for heavier shafts and gears and longer journals.

The Gears. The very highest grade of cast semi-steel gears are used on all sizes. They are made from machine-cut patterns in our own foundry, where different metals are combined into a mixture yielding hardness, toughness, and strength, and where the art of cast gear making is far in advance of ordinary methods. If, however, cut gears are desired, they will be substituted for the exact difference in cost, although they are not considered necessary.



The Up-thrust Bearing upon the pugging shaft is of the Marine Pattern, as indicated by the engraving of the shaft shown herewith, the box being grooved to match the grooves in the shaft. This pattern provides much more thrust surface than can be obtained with collars of reasonable size; a more rigid shaft, due to better support; more room at the feeding point of the machine; a smooth exterior upon which clay will not pile up; and a bearing into which grit can not enter.

The Back-Thrust Bearing for the auger shaft is self-oiling, self-aligning, and adjustable. To the shaft is attached a phosphor-bronze plate which runs against a chilled-iron plate anchored to the frame of the machine. The whole bearing runs in a reservoir filled with oil, the bronze plate having radial grooves which carry up the lubricant and keep the surfaces as nearly frictionless as possible at all times. Both wearing plates are easily removed when worn, without disturbing other parts; may be replaced at a nominal expense, and the whole bearing is closely covered to exclude grit.

The Pugging Shaft and Knives. The pugging Shaft is round and finished throughout its length. It is of large diameter and made of semi-steel. The pugging knives are forged from hard, high-carbon steel, resembling somewhat the shape of a butcher's cleaver, about one inch thick at the back and tapering to a comparatively sharp edge. The shanks are round, fitting easily into round holes in the shaft, where they are held in any desired position with taper keys. This method is much superior to any of the others employed for the same purpose, for the following reasons: First, the practice of attaching knives to the shaft with bolts is objectionable on account of the fact that the knife-shanks, bolt heads, and nuts all present very rough surfaces to the body of the clay in the machine, which cuts down the efficiency and requires more power to rotate the shelf. Second, knives which have solid eyes have to be strung upon the shaft, and to remove one of them not only requires the removal of others, but frequently the shaft itself has to be removed from the machine. Third, the pitch of any or all the knives may be easily altered, and each knife may be set out when worn or moved to the next lower position, where it is as good as a new one, thus giving easily twice the service to be obtained otherwise.

Inspection of a machine which has been run a short time plainly shows the relative efficiency of the two methods. In one case the pugging shaft is surrounded by a wad of clay extending throughout its length, while in a machine having forged knives of the kind described it will be found that they have been working clear down to the shaft, and that the shaft is polished bright, all of which indicates maximum work with minimum power.

The Augers or Expressing Screws are of entirely new pattern, their form and pitch having been determined by many years' experience and experiments with hundreds of different patterns. They are made of white iron, a material which combines to the greatest possible extent the features of hardness and toughness necessary for such parts, and which will give three times the service of ordinary cast or chilled iron. The front section of the augers is closely surrounded by a corrugated casing, also made of white-iron, which is so mounted in the face plate that it may be easily replaced when worn.

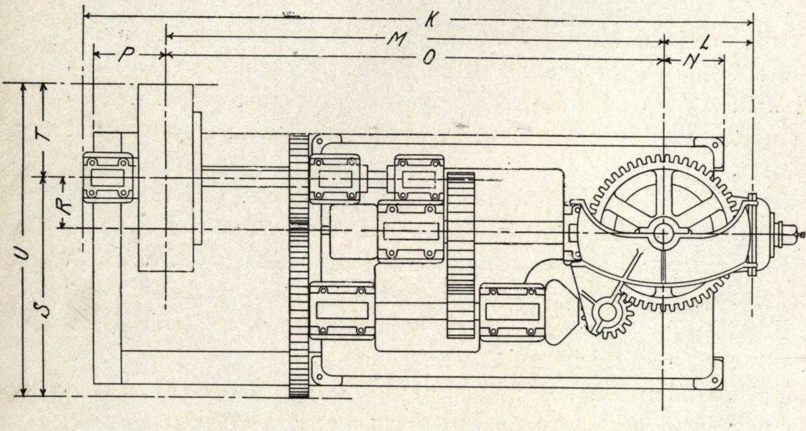
The Stuffing Box. Where the auger shaft passes through the lower portion of the vertical cylinder a stuffing box is provided to prevent the escape of clay and wear upon the shaft. The shaft at this point is protected by a collar which revolves with it and which has a machined flange fitting into a machined recess with two sole leather washers between. Means are provided for keeping the washers saturated with oil, and neither the shaft, the recess, the collar or the washers are subject to undue wear. Most important of all, however, is the fact that there is no leakage of clay or wear upon the shaft.

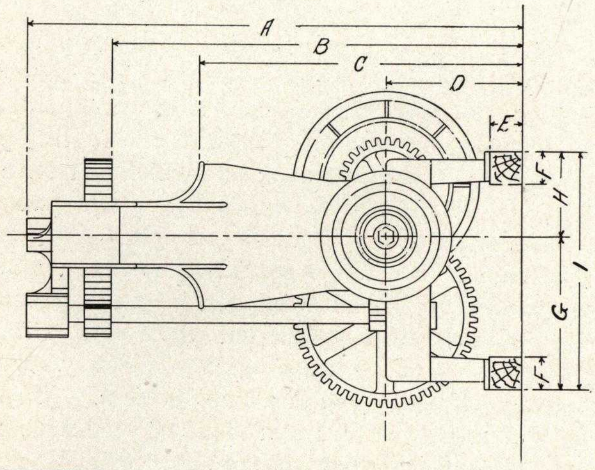
The Driving Pulley is of the Friction Clutch Pattern, the Type C, 4-arm clutch being furnished with the No. 10 A and the Type B with the No. 9 B and smaller sizes. They are both thoroughly reliable patterns, fully capable of transmitting the power necessary to drive the machine.

Machine Number	NUMBER OF PIECES PER HOUR			
	4 in. Tile	8 in. Tile	12 in. Tile	Side-cut Brick
10 A	2,500	1,500	750	5,000
9 B	1,500	750	500	3,000
5 B	1,000	500	250	2,000

The Capacity. In rating the capacity of the different sizes the unfavorable conditions which will sometimes surround the operation of the machine have been taken fully into consideration, and the accompanying table has been prepared to show the output of several different kinds of ware from the three sizes under average unfavorable circumstances.

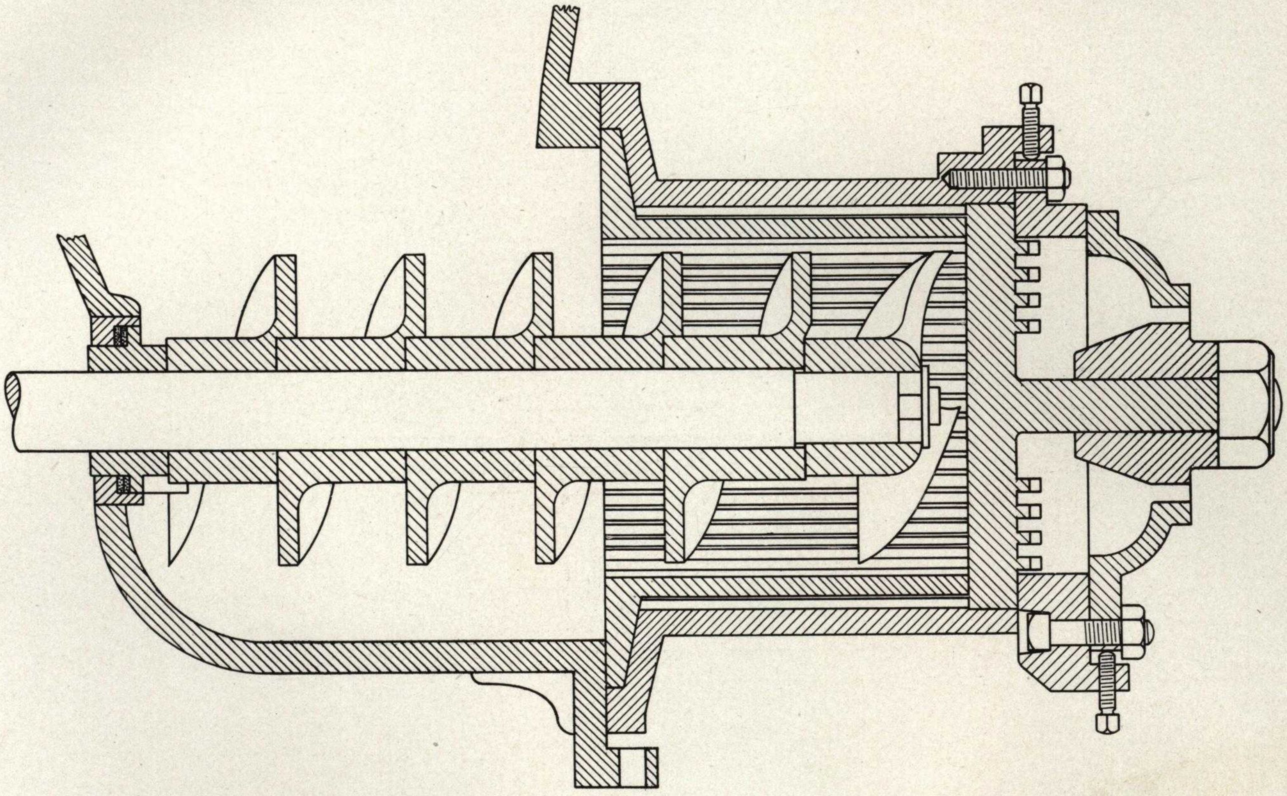
The above does not by any means show the maximum capacity under favorable conditions, neither does it specify all the different kinds of ware the machines are capable of making, but the intention is to give as accurately as possible a general idea in a manner which will not mislead any prospective purchaser and at the same time explain why a conservative rather than a maximum rating is given.





Dimensions In Inches, Brewer Drain Tile and Hollow Block Machines.

	Machine Number				Machine Number		
	10 A	9 B	5 B		10 A	9 B	5 B
A	106	92	87½	L	17	15½	12¼
B	85	76	72¾	M	93	91⅛	82½
C	68	58½	56⅞	N	13¼	10½	9½
D	30	24½	24	O	93½	91⅛	82½
E	6	6	6	P	19½	12½	12¼
F	8	8	6	R	8¼	9 5/16	9
G	34	28	22¼	S	43½	40 5/16	35¼
H	28	17½	15¼	T	22½	17	17
I	62	45½	37½	U	66	57 5/16	52¼
K	132	130½	108¾				



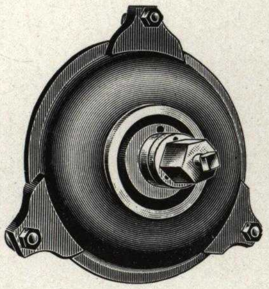
Brewer Special Drain Tile and Hollow Block Machines

The method of supporting cores by means of spider or bridge

WHEN the nature of the clay will permit and the variety of the output is such that a longer expressing screw is required, the hollow auger shaft, described elsewhere, may be replaced by a solid shaft, and the cores of tile dies held by a cast-steel spider or bridge, as shown above. This method can not be recommended for the majority of surface clays, but there are cases where it may be used to advantage. Brewer Machines supplied with these parts are known as "Special."

Drain Tile Dies

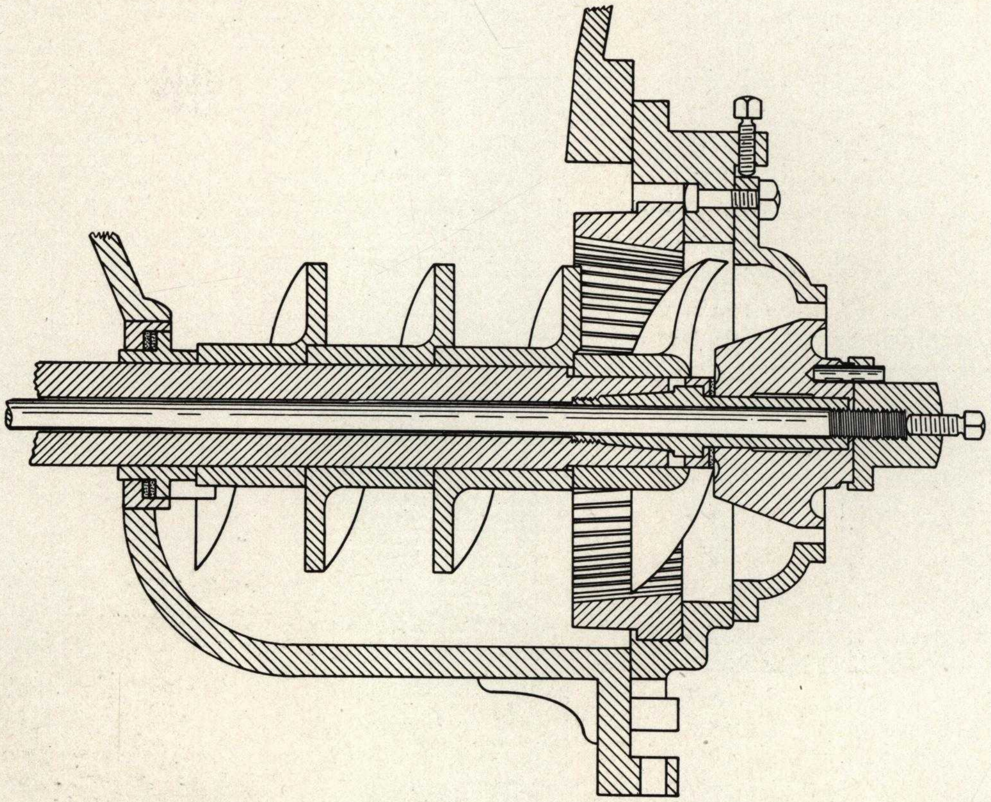
Drain-tile dies having the dimensions shown in the table herewith are considered standard, and are carried in stock for immediate shipment at any time. All dies of other dimensions or patterns are made to order, from three to six days being required to produce them.



Brewer Tile Dies are made from a very hard metal, just as hard as it can be and still allow the proper machining of the casting. They are produced in our own foundry, where the requirements are known, and nothing but an excellent casting will pass inspection. The advantage of a tile die made from a close, hard casting is appreciated by experienced tile makers, and although it is a comparatively small item, it is one of the many little things which lend to the efficiency and popularity of Brewer Drain Tile Machines. Average weight of Tile Dies, each 175 pounds.

Standard Dimensions of Drain Tile Dies

Size of Tile	Diam. of Core in Inches	Bore of Funnel in Inches	Thickness of Shell	Size of Tile	Diam. of Core in Inches	Bore of Funnel in Inches	Thickness of Shell
2.5	2.75	3.75	.5	8	8.8	10.4	.8
3.	3.3	4.4	.55	9	9.9	11.6	.85
3.5	3.85	4.95	.55	10	11.	12.8	.9
4.	4.4	5.6	.6	12	13.2	15.2	1.
4.5	4.95	6.15	.6	14	15.4	17.6	1.1
5.	5.5	6.8	.65	15	16.5	18.8	1.15
6.	6.6	8.	.7	16	17.6	20.	1.2
7.	7.7	9.2	.75	18	19.8	22.4	1.3



Brewer Standard Drain Tile and Hollow Block Machines

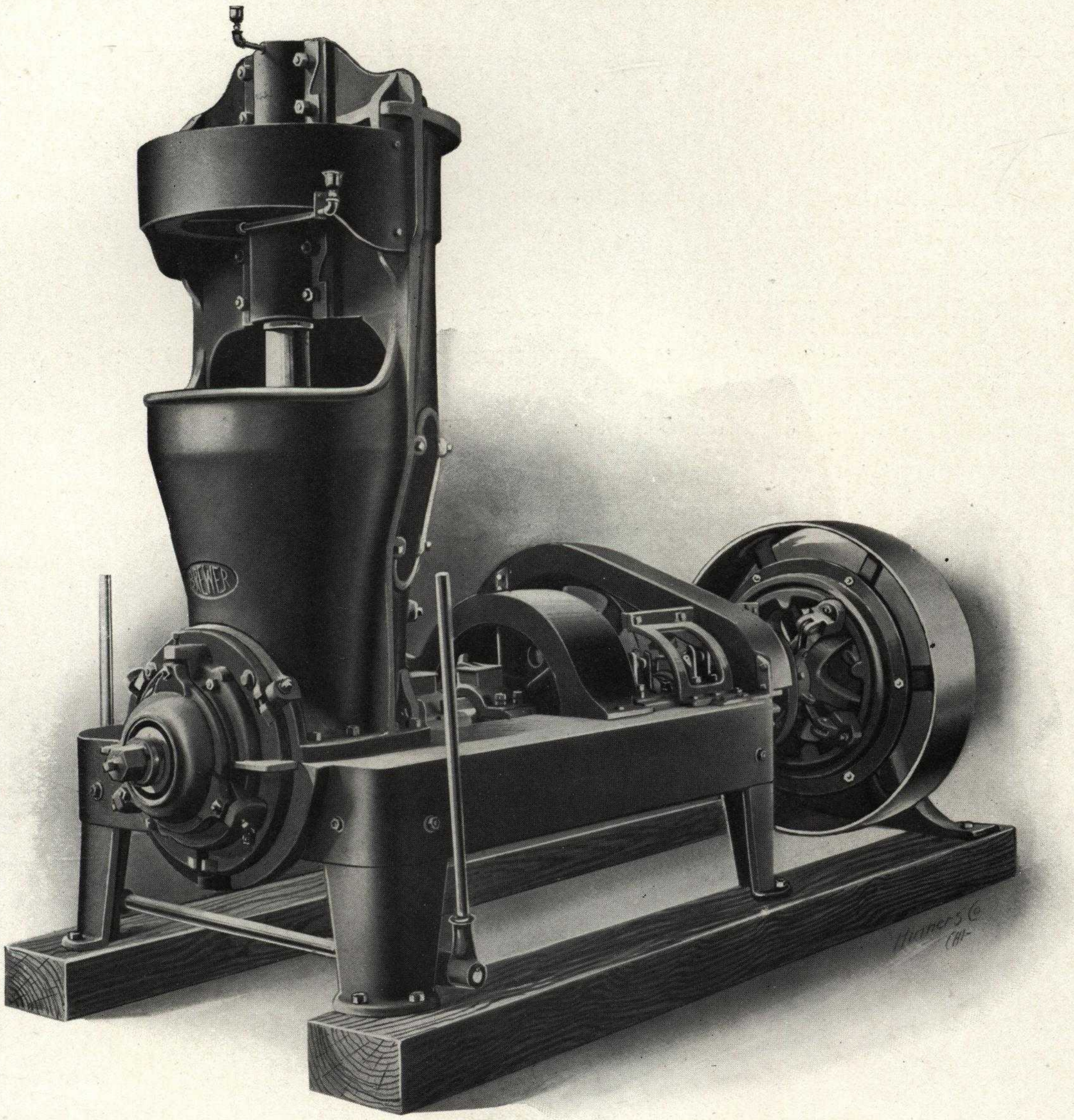
The method of supporting cores without spider or bridge

THE arrangement illustrated in detail by the sketch above, serves to support the cores of tile dies without anything whatever in the nature of a spider or bridge or anything else over or around which the clay must pass just before it is formed into shape. It is a most valuable feature to the large majority of drain tile manufacturers who use surface clays or any material which does not unite readily after having passed over a spider or bridge and produces a tile with a tendency to crack lengthwise. In addition to this, the absence of the spider or bridge makes it possible to locate the tile die closer to the auger or expressing screw, materially decreasing the amount of power required to produce a given output.

By this method the cores are supported upon the end of the auger shaft in the following manner: The shaft is hollow throughout its length, and has in the front end a taper socket into which a cast-steel core stem is drawn with a left-hand thread. A recessed washer or collar is placed upon this stem to protect the otherwise exposed portions of it from wear, and the core then put on with a small space allowed between the two parts for a leather washer or packing. The core is held in position by a large recessed nut engaging the threads of the core rod, which extends through the shaft to the rear end of the machine, where it is held rigid by means of a yoke. The large front nut is locked in position by means of a set-screw, and rotation of the core is prevented by a safety pin passing through the flange of the nut into the core itself. The method is not new, having been in use upon Brewer machines for nearly twenty years, and its success is unquestioned.

The fact that the hollow auger shafts used in some other machines have been a source of trouble on account of clay working into the hole, should not be considered as having any bearing whatever upon this method, for the conditions are entirely different, and it is very easy to see, by reference to the cut, that with the Brewer plan it is impossible for clay to get inside the hollow shaft, as there is no place for it to enter.

In some of the early Brewer machines the cores were supported upon the end of the auger shaft, being held by a solid stem which was a part of the shaft. With that method the cores were free to revolve, and their forward pressure was taken by a nut on the end of the stem. Sometimes the spiral motion of the column, and heating of the core caused by forward pressure and revolution, were considered an objection, and, therefore, it should be understood that the method described above eliminates entirely the undesirable features of the practice followed in the early history of the art.



No. 10B Drain Tile Machine

In size this machine is practically the same as the No. 10A shown upon page 17, although in weight it is 2,000 pounds heavier. In construction it is of the very highest grade, including cut gears throughout, hammered steel shafts, forged high-carbon steel knives and white-iron augers and casings. A comparison of the cuts will show how the extra weight has been distributed, resulting in deeper flanges upon the gear-frames, heavy ribbing upon the vertical cylinder and guards or covers over all gears. The friction clutch is of the Type F-29 inch pattern, and the pulley is solid iron, triple-belt specifications.

The particular machine shown by these engravings has the opening to receive the clay directly in front and can be fed from either side or from the front, as desired. This opening is usually made upon the right-hand side as observer faces die, as shown by the engraving of the No. 10A upon page 17, and in that position is considered standard rather than as shown above.

While cut gears are a standard specification of this machine, it can be supplied with the regular cast semi-steel gears at a proportionally lower price.

Attention is especially directed to the specifications upon the next following page, where also appears another engraving showing the other side of the machine.

Specifications—No. 10B Machine

Weight—12,500 pounds.

Length—Over all, 10 ft. 10 in.

Width—Over all, 5 ft.

Height—Over all, 8 ft. 4 in.
From bottom of leg to feeding point, 5 ft. 1¾ in.

Shafts—Driving, $3\frac{7}{16}$ in. diameter.
Intermediate horizontal, $3\frac{15}{16}$ in. diameter.
Outside Upright, $3\frac{11}{16}$ in. diameter.
Auger shaft, 4 in. diameter.
Pugging shaft, 6 in. diameter.
All hammered steel.

Gears—1st reduction, spur, 2¼ in. pitch, 5 in. face.
2d reduction, spur, 2 in. pitch, 8 in. face.
2d reduction, bevel, 2¼ in. pitch, 4½ in. face.
3d reduction, spur, 2¼ in. pitch, 7 in. face.

Journals—10 and 12 in. long.

Outboard Bearing and independent leg for driving shaft.

Driving Pulley—Friction clutch, Type F (29 in.), 45 in. diameter, 12 in. face, solid iron, triple belt.

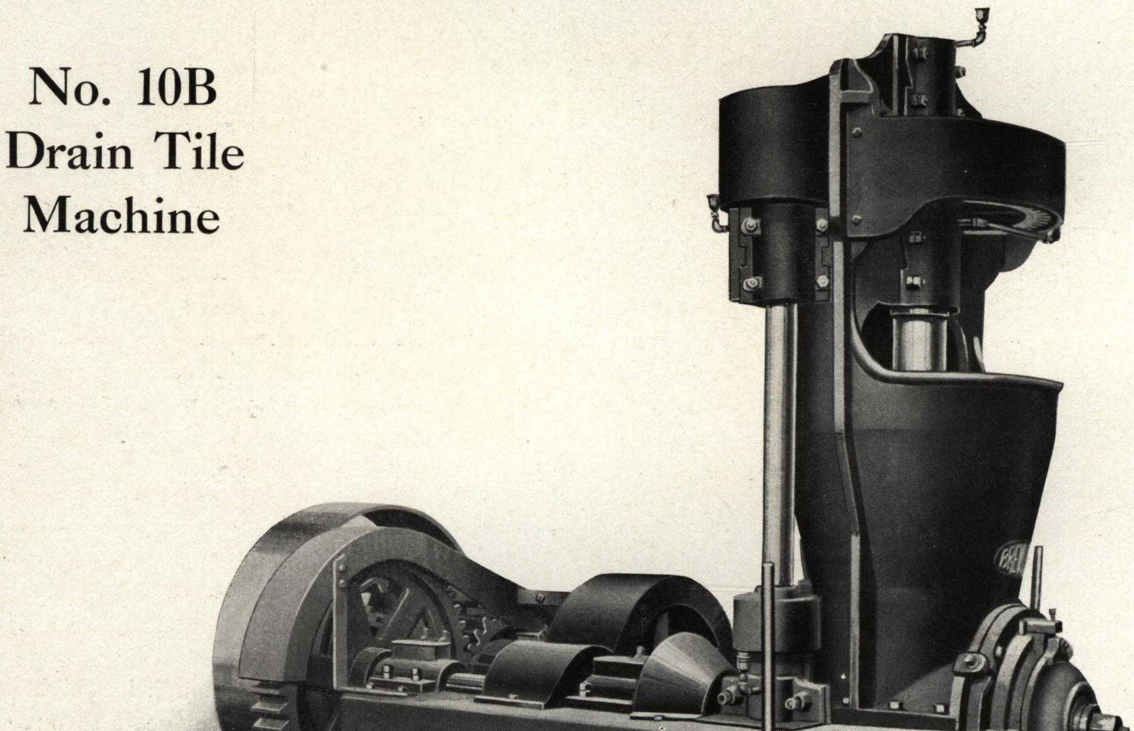
Motor Drive—Suitable first reduction gears to provide for direct connected electric motor drive will be substituted for friction clutch and pulley without additional expense.

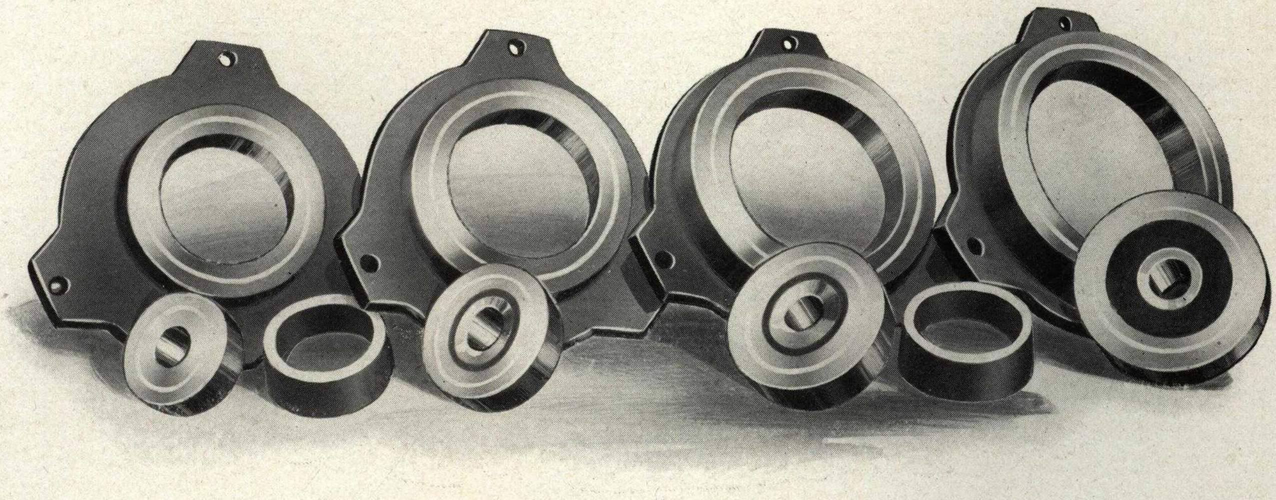
Speed of Driving Shaft—180 to 225 revolutions per minute.

Direction of Revolution—Pulley runs over from left to right as observer faces die. Left-hand parts to permit driving in opposite direction substituted without extra cost.

Capacity—3,500 to 4,500 4-in. tile per hour.

No. 10B Drain Tile Machine





No. 122 Drain Tile Dies.

With removable hard cast iron bushings and sleeves.

SINCE the beginning of the drain-tile industry there has been more or less urgent call for dies having removable bushings and sleeves for funnels and cores respectively; which, when worn, could be replaced with new ones at a less cost than that involved by an entire new part; and as the drain-tile business has grown to proportions which involve the shipment by rail of a large portion of the product, it is now much more necessary than ever before to keep the ware to size through frequent renewal of the die parts.

Several attempts in the past to design dies which would meet these conditions have resulted in failure owing to the fact that all of the methods devised provided bushings and sleeves which cost as much, and in some cases even more, than the old pattern dies themselves. Attempts were also made to use different and more durable materials for these bushings and sleeves, and great results were expected from hardened tool-steel and manganese steel, but the peculiar attritional wear to which a tile die is subject was found to affect these materials very much more in proportion to their cost and the cost of working them than it does the hard, close-grained cast-iron from which Brewer dies have always been made.

With these No. 122 Pattern Dies, however, it has been made possible, not only to take advantage of the low cost of cast iron; but, owing to their size, to make the bushings and sleeves still harder, closer grained, and more durable than they were before; and in addition, to place the drain-tile maker in a position where he may replace a worn core-sleeve or funnel bushing with a new one at a nominal cost without discarding the body of the core or funnel upon which no destructive wear ever takes place.

The 3, 3½, and 4 inch cores are too small in size to permit the use of removable sleeves; but, by reference to the price list below, it will be seen that the cost of these parts is very low; not only lower than similar parts have been before, but very little in excess of the cost of the sleeves. The cores from 5 inches to 8 inches, however, and all sizes of funnels from 3 inches to 8 inches inclusive, are provided with removable wearing surfaces which are held to their proper positions by means of soft metal joints which can be made by the purchaser in a very simple manner, in a very short time and with no special tools, as will be described later.

Finished core and funnel bodies are carried in stock for immediate shipment, and rough castings for the bushings and sleeves are on hand at all times in sufficient variety of sizes to insure shipment of either complete core or funnel, or a bushing or sleeve finished to any special size, upon the same day that the order is received. The range of sizes to which these parts can be finished is shown in both common and decimal fractions by the table below which has been based upon all of the different specifications for special dies which have been received throughout a period of ten years.

Range of Sizes, No. 122 Tile Dies

Size of Tile	CORE SLEEVES WILL FINISH				FUNNEL BUSHINGS WILL FINISH			
	From		To		From		To	
	Common	Decimal	Common	Decimal	Common	Decimal	Common	Decimal
3	3	3.0	3 9/16	3.562	4⅛	4.125	4¾	4.75
3½	3½	3.5	4 1/16	4.062	4 11/16	4.687	5¼	5.25
4	4	4.0	4 13/16	4.812	5⅛	5.125	6¼	6.25
5	5	5.0	5 13/16	5.812	6⅜	6.375	7¼	7.25
6	6	6.0	6⅞	6.875	7 7/16	7.437	8¾	8.75
7	7	7.0	7 15/16	7.937	8 11/16	8.687	10¼	10.25
8	8	8.0	9 1/16	9.062	9 13/16	9.812	11	11.00

The No. 122 Pattern Dies are interchangeable with Brewer No. 51 or No. 100 Patterns, and are of proper specifications to be used upon all Brewer SPECIAL Upright Machines, all Brewer Horizontal Drain Tile Machines and all Brewer Horizontal Brick Machines with drain-tile attachments; that is, a No. 122 3-inch core can be used with either a No. 51 or No. 100 3-inch funnel, and vice versa, through all the different sizes up to and including 8-inch. It is therefore possible for those drain-tile makers now having either No. 51 or No. 100 dies to procure, one at a time, the No. 122 cores and funnels if they so desire, and thus at a very small additional cost equip themselves in a short time with the later patterns.

In the tabulated price list below the amounts noted in the column headed "Core Complete" indicate the price of the solid core in the case of the 3, 3½, and 4 inch sizes and the prices of the body and sleeve assembled and attached complete in the case of the larger sizes. Likewise the column headed "Funnel Complete" shows the price of the funnel body with a bushing assembled and attached complete for each size. The column "Die Complete" shows the prices for complete dies of each size, and include a complete core and a complete funnel of the size designated.

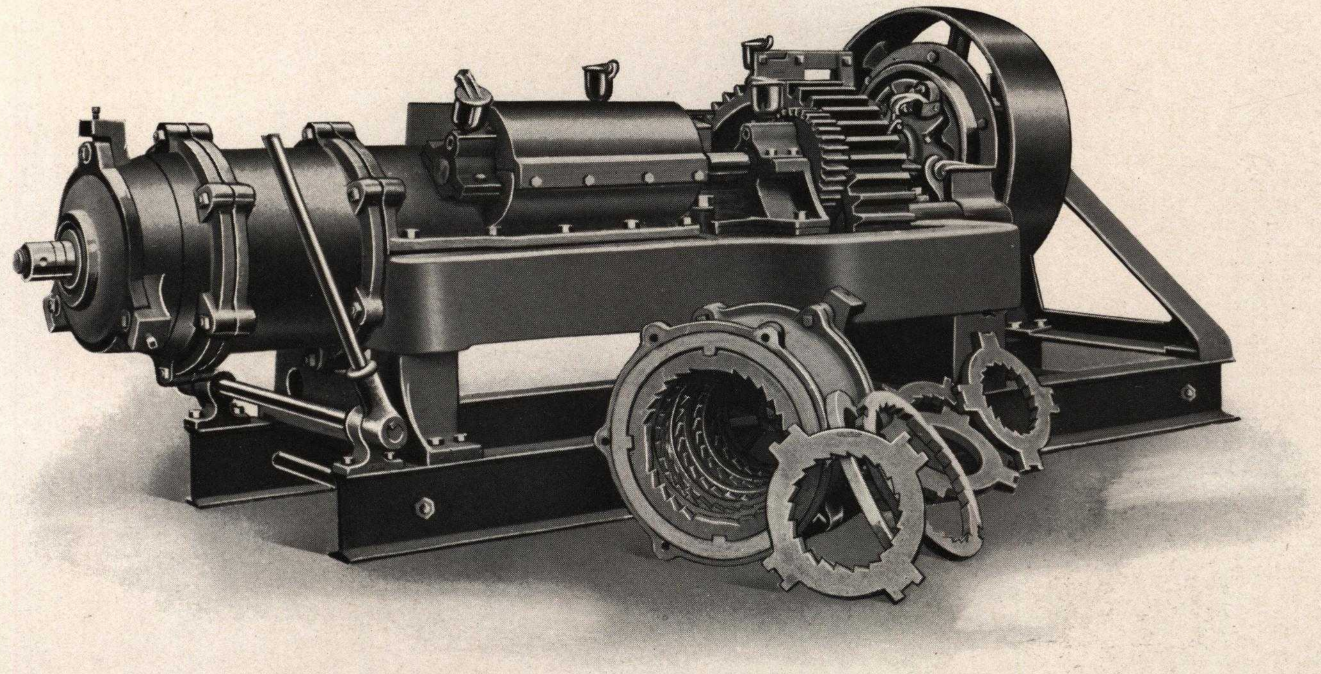
Net Price List, No. 122 Tile Dies and Parts

Size Tile	Die Complete	CORE			FUNNEL		
		Body	Sleeve	Complete	Body	Bushing	Complete
3	$ 8.00			$1.75	$4.25	$1.25	$6.25
3½	8.25			2.00	4.25	1.25	6.25
4	8.50			2.00	4.25	1.50	6.50
5	9.50	$1.00	$1.25	2.50	4.00	2.00	7.00
6	11.50	1.25	2.00	4.00	4.00	2.25	7.50
7	12.75	1.75	2.25	4.75	4.00	2.75	8.00
8	14.00	2.00	2.75	5.50	3.75	3.25	8.50

Instructions for attaching and removing core sleeves and funnel bushings.

THE fronts of all bodies, sleeves and bushings are faced true, and in the case of core bodies, square with the hole. To attach a sleeve or bushing, first lay the body front down upon a true, smooth, and dry metal surface; then locate the sleeve or bushing inside of it if it is a funnel, or around it if a core, and with the eye make the open space between body and bushing or sleeve equal all the way around. Pour hot melted lead into the open space and the job is done. Special precaution should be used to make sure that both body and bushing lay flat on the metal surface upon which the work is being done and that the parts are centered carefully. See that everything is dry and that the molten lead is hot enough to char a white pine stick.

To remove a bushing or sleeve it is only necessary to drive it out of the body if a funnel, or off the body if a core; taking care in each case not to mar the finished front edge of the body. The lead, of course, should be removed before another sleeve or bushing is put in place.



The No. 98 Horizontal Drain Tile Machine

THIS machine differs from the No. 88 Horizontal Drain Tile Machine shown upon catalog page 19a principally in that it has cast gears running open instead of cut gears running in oil. The open gearing permits considerable difference in the design of the frame, which materially decreases the cost of building the machine; but all parts are of the same relative size, weight and strength with the exception of the friction clutch and pulley which may be substituted by the larger size in cases where maximum output is desired.

To those who, for any reason, do not approve of cut gears with the increased cost which they involve, this machine offers every advantage of the No. 88 at a substantially less price.

Prominent among the especially desirable features of this machine are the sectional, removable liners which surround the auger from one end to the other; while upon the front end, as shown in the engraving, arrangements are provided for keeping the auger tightly encased even after it has worn to a great extent.

Specifications

WEIGHT—7,150 pounds.

LENGTH—Over all, without die, 11 ft. 4¼ in.

WIDTH—Over all, 55¾ in.

HEIGHT—Over all, 48 in.
To top of hopper, 36⅜ in.

SHAFTS—Driving, 3½ in. diameter, steel.
Auger, 4½ in. diameter, steel.

GEARS—8 in. face, 2 in. pitch.

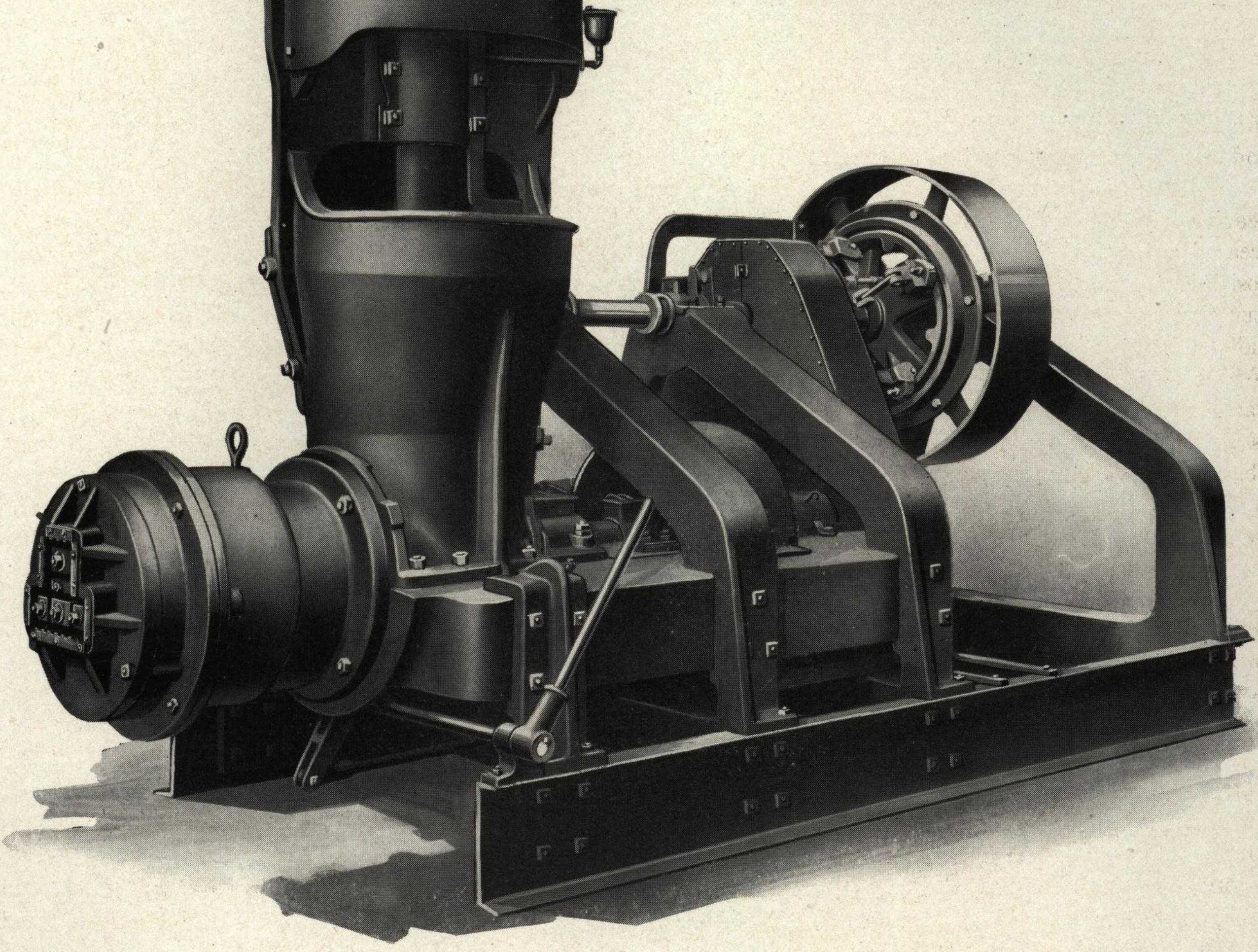
JOURNALS—12 in. long, self-oiling.

OUTBOARD BEARING for driving shaft mounted on same I-beams as balance of machine.

DRIVING PULLEY—Friction clutch, Type F, 20 in. Pulley, ~~34~~ 42 in. by 10 in., solid iron.

SPEED OF DRIVING SHAFT—100 to 130 revolutions per minute.

DIRECTION OF REVOLUTION—Top of pulley runs from the machine upon stock patterns. The opposite direction of revolution can be furnished on short notice.



No. 10C Hollow Ware Machine.

Weight, 17,000 pounds.

Capacity, 150 tons standard dimension fire-proofing per 10-hour day.

For description and complete specifications see next following page.

No. 10C Hollow Ware Machine.

THIS machine is a development in the production of hollow ware, particularly fireproofing and special shapes, which has involved many years of experience and no small expense. It has been largely a development of capacity, for the superior quality of the ware produced by the Upright Machine has been recognized for years; but the preservation of these quality factors in a machine of greatly increased capacity and high efficiency is the point which assures the operator of a high percentage of ware safely through the dryer and kiln.

The character or quality of the ware produced by the Upright type of machine is favorably effected; first, by the increased pugging under pressure which takes place in the vertical cylinder where there are eight knives and one auger; second, by the change of direction which is given the clay when it is taken from the vertical cylinder by the horizontal augers, the planes of which are at right angles to those in the cylinder above; third, by the comparatively short auger, the use of which is made possible through the force-feed effect of the vertical cylinder; and fourth, by the low speed of the auger, made possible by its size, its form, and the force-feed effect just mentioned.

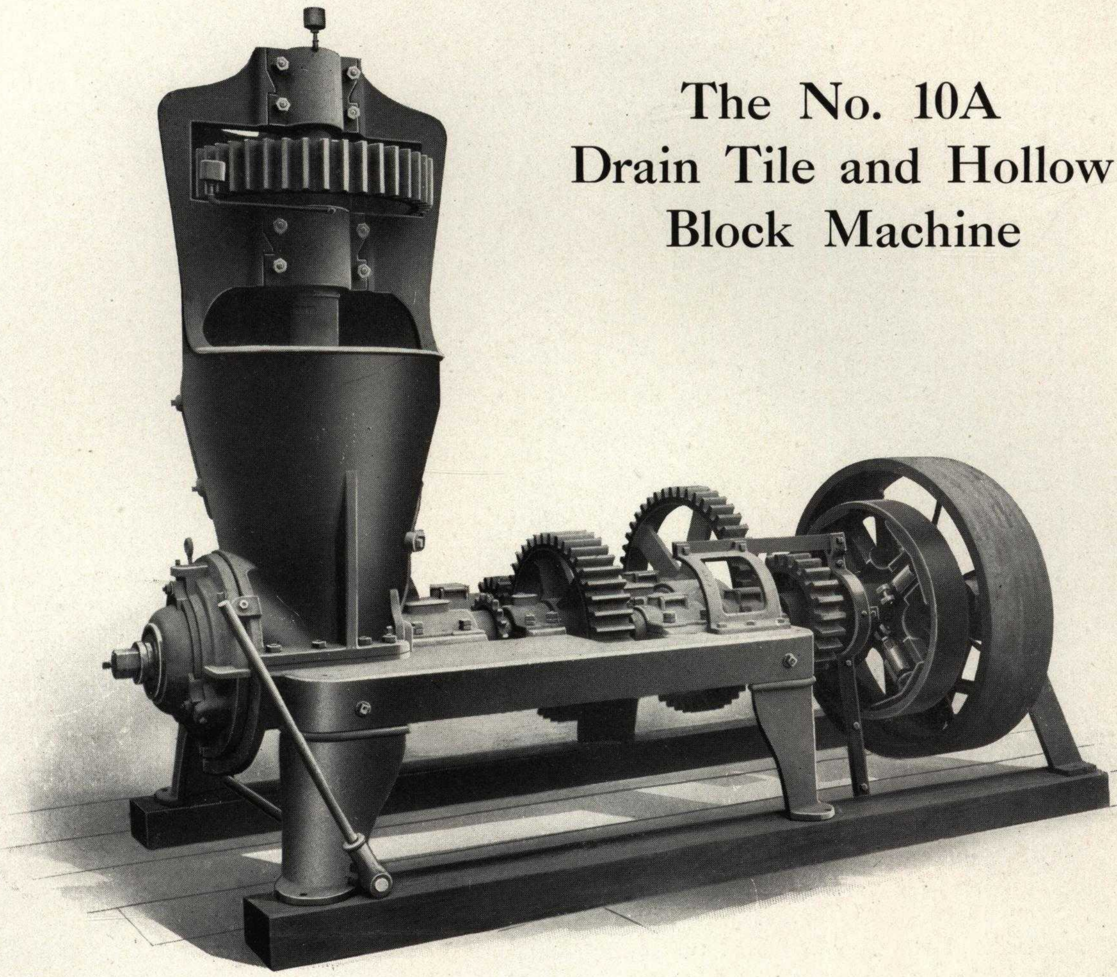
Although of somewhat greater general size than any previous model of its type, the No. 10C Machine is heavier in a marked degree through the increase in the size of those parts upon which the stresses of increased output are placed, and through the rigidity of the construction which holds the working parts in position. A glance at the specifications below will bring out these details to advantage, but the following construction points are worthy of special notice. The Knives are forged from hard, high-carbon steel, each one independently adjustable for pitch. The Augers are made of white iron very hard, strong and durable, and of high efficiency, not only on account of their shape, but on account of the hardness of their material. The Casings are also of white iron and are sectional in form so that wear upon the casings themselves and augers as well may be easily and quickly taken up. The Thrust Bearings are of the grooved marine pattern, with liberal bearing surfaces and with auxiliary disc bearings of chilled iron and phosphor bronze where the thrust is severe. The Gears differ in specifications according to their service, and the requirements which experience has developed. The specifications below show the exact character of each pair of gears, and the illustration upon preceding page indicates the methods of covering them.

The engraving shows the opening, into which the clay is to be fed, to be on the right-hand side as the observer stands facing the machine, but this opening can be located directly in front, in which condition the machine can be fed from either side.

Specifications.

- Weight—17,000 pounds.
- Length—Over all, 13 feet.
- Width—Over all, 6 feet 3 inches.
- Height—Over all, 9 feet.
  - From bottom of skid to feeding point, 5 ft. 6 in.
- Shafts—Driving, $3\frac{7}{16}$ inches diameter.
  - Intermediate horizontal, $3\frac{15}{16}$ inches diameter.
  - Outside upright, $3\frac{11}{16}$ inches diameter.
  - Auger shaft, 6 inches diameter.
  - Pugging shaft, 6 inches diameter.
  - All hammered steel.
- Gears—First reduction, spur, 6-inch face, cast steel, cut teeth.
  - Second reduction, spur, 8-inch face, pinion cast steel, gear semi-steel.
  - Second reduction, bevel, $4\frac{1}{2}$-inch face, semi-steel.
  - Third reduction, spur, 7-inch face, semi-steel.
- Journals—10 and 12 inches long.
- Outboard Bearing—Mounted on same channels as balance of machine, self-contained.
- Driving Pulley — Friction clutch, Type "F" (29 inches), 45 inches diameter, 12-inch face, solid iron, triple belt.
- Motor Drive — Suitable gears for direct connected electric motor drive will be substituted for friction clutch and pulley without additional expense.
- Speed of Driving Shaft—180 to 225 revolutions per minute.
- Direction of Revolution—Pulley runs over from right to left as observer faces die. Parts to permit opposite direction of revolution substituted without extra cost.
- Capacity—15 tons standard dimension fireproofing per hour.

The No. 10A Drain Tile and Hollow Block Machine



THIS size has won an enviable position with the users of large capacity machines, and its output seems to be limited only by the ability to handle the product. The standard pattern, as shown by the engraving, has the opening to receive the clay upon the right-hand side as observer faces the die, but when desired the machine can be built with the opening directly in front, when it may be fed from either side.

Specifications

WEIGHT—10,510 pounds.

LENGTH—Over all, 10 ft. 10 in.

WIDTH—Over all, 5 ft.

HEIGHT—Over all, 8 ft. 4 in.
  From bottom of leg to point where clay is fed in, 5 ft. 1¾ in.

SHAFTS—Driving, 3 in. diameter, steel.
  Intermediate horizontal, 3½ in. diameter, steel.
  Outside upright, 3½ in. diameter, steel.
  Pugging, 6 in. diameter, semi-steel.

GEARS—First reduction, spur, 4⅜ in. face, 2¼ in. pitch, semi-steel.
  Second reduction, spur, 6 in. face, 2 in. pitch, semi-steel.
  Second reduction, bevel, 4½ in. face, 2¼ in. pitch, semi-steel.
  Third reduction, spur, 6 in. face, 2¼ in. pitch, semi-steel.

JOURNAL BOXES—10 and 12 in. long.

OUTBOARD BEARING and independent leg for driving shaft.

DRIVING PULLEY—Friction Clutch, Type C, 45 in. diameter, 12 in. face.

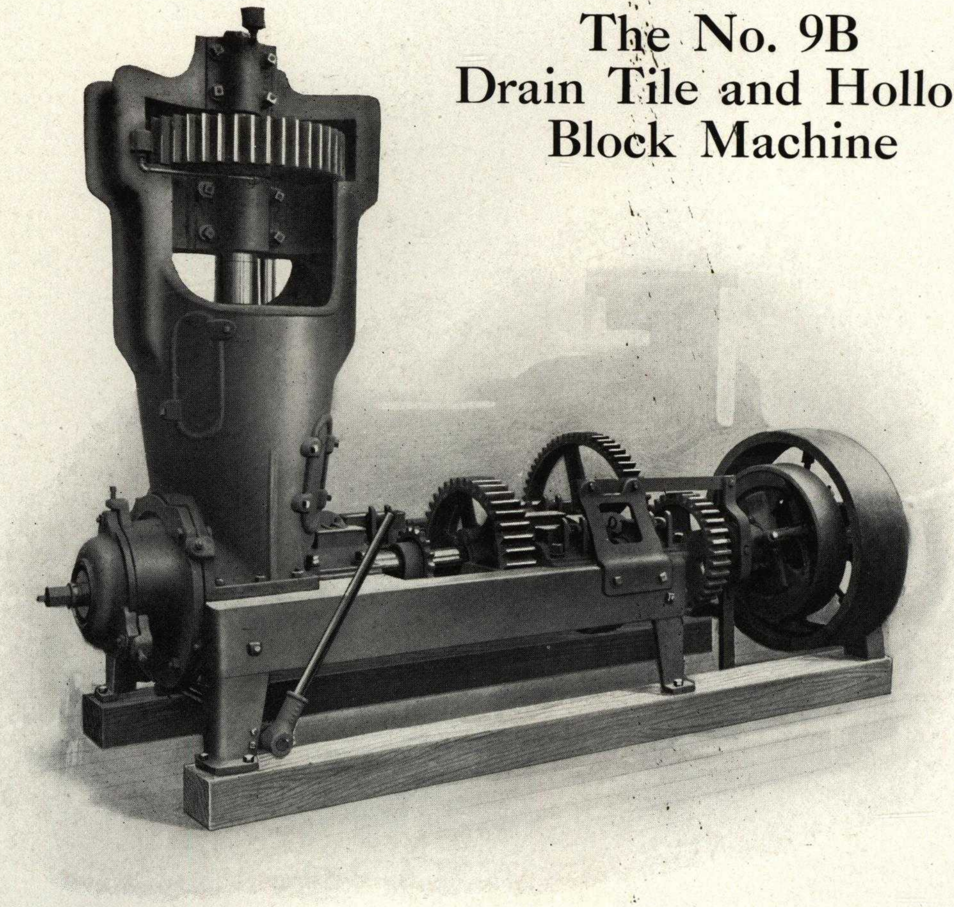
MOTOR DRIVE—If so specified in the order, suitable first reduction gears to permit direct connected electric motor drive will be substituted without extra expense.

SPEED OF DRIVING SHAFT—180 to 225 revolutions per minute.

DIRECTION OF REVOLUTION—The pulley of the standard machine is to be driven over from left to right as observer stands facing die, but if so specified in the order, necessary parts will be furnished to provide for driving in the opposite direction, without extra charge.

CAPACITY—5,000 to 7,500 standard size brick per hour under average favorable conditions. Other kinds and sizes of ware in proportion.

The No. 9B Drain Tile and Hollow Block Machine



THE hundreds of tile makers who have used the No. 9A pattern will appreciate the superiority of this one, which, having passed through complete reconstruction, is without any question closer to the point of perfection than has ever before been attained by a medium capacity machine. It is worth while to read the foregoing general description to get a thorough understanding of the construction, which is certainly high-grade and in advance of all previous practice.

Specifications

WEIGHT—6,820 pounds.

LENGTH—Over all, 10 ft. 6 in.

WIDTH—Over all, 4 ft. 7 in.

HEIGHT—Over all, 7 ft. 2 in.
From bottom of leg to point where clay is fed in, 4 ft. 5 in.

SHAFTS—Driving, 2⅞ in. diameter, steel.
Intermediate horizontal, 3½ in. diameter, steel.
Outside upright, 3 in. diameter, steel.
Auger, 4 in. diameter, steel.
Pugging, 5½ in. diameter, semi-steel.

GEARS—First reduction, spur, 3⅜ in. face, 1½ in. pitch, semi-steel.
Second reduction, spur, 5 in. face, 1¾ in. pitch, semi-steel.
Second reduction, bevel, 5 in. face, 1¾ in. pitch. semi-steel.
Third reduction, spur, 5½ in. face, 1⅞ in. pitch, semi-steel.

JOURNAL BOXES—9 and 12 in. long.

OUTBOARD BEARING and independent leg for driving shaft.

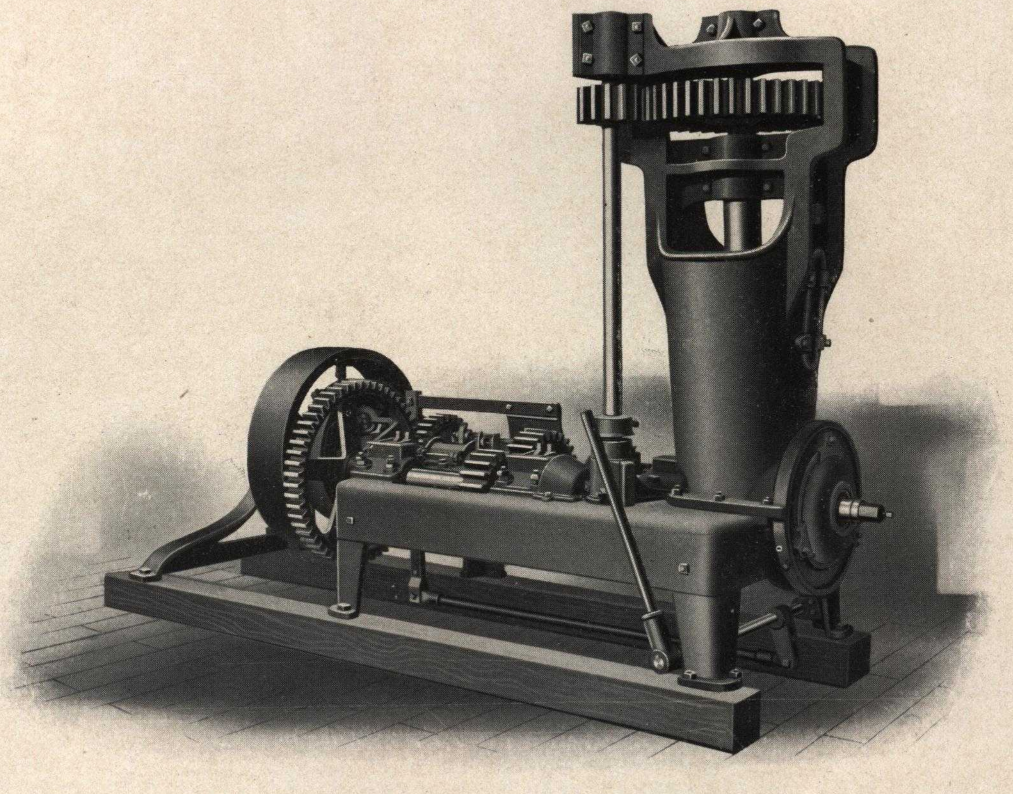
DRIVING PULLEY—Friction Clutch, Type B, 34 in. diameter, 10 in. face.

MOTOR DRIVE—If so specified in the order, suitable first reduction gears to permit direct connected electric motor drive will be substituted without extra expense.

SPEED OF DRIVING SHAFT—150 to 180 revolutions per minute.

DIRECTION OF REVOLUTION—The pulley of the standard machine is to be driven over from left to right as observer stands facing die, but if so specified in the order, necessary parts will be furnished to provide for driving in the opposite direction, without extra charge.

CAPACITY—2,500 to 4,000 standard size brick per hour under average favorable conditions. Other kinds and sizes of ware in proportion.



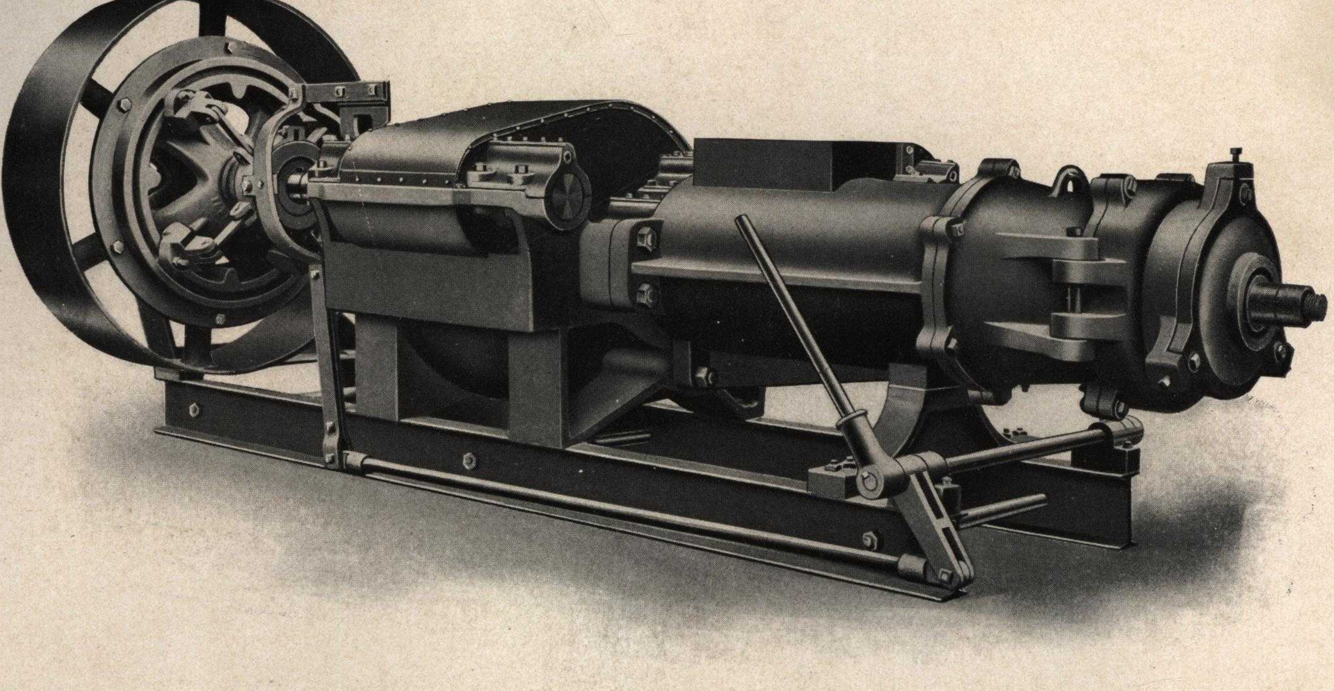
No. 5B Drain Tile Machine

ALTHOUGH smaller in size and capacity, the construction of the No. 5B is the same high grade as that of the larger machines, and the foregoing general description of design applies to every detail. The illustration is faithful and accurate, and the specifications below give a clear understanding of the size and strength of all important parts.

Especial attention is directed to the fact that the capacity rating below is intended to be sufficiently small to provide against all ordinary unfavorable circumstances with a liberal margin of safety, and that with free running clays a substantial increase may be expected.

Specifications

Weight—5,550 pounds.
Length—Over all, 8 ft. 10 in.
Width—Over all, 4 ft. 1 in.
Height—Over all, 6 ft. 9 in.
    From bottom of leg to point where clay is fed in, 4 ft. 2 in.
Shafts—Driving, 2½ in. diameter, steel.
    Intermediate, 2⅞ in. diameter, steel.
    Outside upright, 2⅝ in. diameter, steel.
    Auger, 3⅜ in. diameter, steel.
    Pugging, 5 in. diameter, semi-steel.
Gears—First reduction, spur, 3 in. face, 1½ in. pitch, semi-steel.
    Second reduction, spur, 4½ in. face, 1½ in. pitch, semi-steel.
    Second reduction, bevel, 3⅛ in. face, 1½ in. pitch, semi-steel.
    Third reduction, spur, 4½ in. face, 1⅞ in. pitch, semi-steel.
Journal Boxes—8 to 10 in. long.
Outboard Bearing and independent leg for driving shaft.
Driving Pulley—Friction clutch, type F, 20 in., pulley, solid iron, 34 in. diameter, 8 in. face.
Motor Drive—If so specified in the order, suitable first reduction gears to permit direct connected electric motor drive will be substituted without extra expense.
Speed of Driving Shaft—120 to 150 revolutions per minute.
Direction of Revolution—The pulley of the standard machine is to be driven over from left to right as observer stands facing die, but if so specified in the order, necessary parts will be furnished to provide for driving in the opposite direction, without extra charge.
Capacity—2,000 to 2,500 standard size brick per hour. Other kinds and sizes of ware in proportion.



Note the one-piece cylinder, the one-piece gear frame, and the *covered cut gears* running in oil.

No. 88 Horizontal Drain Tile Machine

This machine is designed particularly to produce the greatest possible output of drain tile between three inch and twelve inch inclusive from material which has previously had suitable preparation. It is a high-grade high-speed machine in every sense, and neither the design nor the quantity or character of the materials entering into it are restricted by any reasonable cost.

The gear frame and cylinder are heavy one piece castings; the shafts are of hammered steel; the augers of a specially treated material, and the casings, which surround the entire auger, are removable and of white iron. The gears are cut from the solid, run continuously in oil and are fully covered. The feed roll creates a high efficiency force feed and keeps the hopper clear at all times. All bearings are self-oiling, and the back-thrust bearing is self-aligning and adjustable as well. The friction clutch is of a large heavy-duty disc pattern and the pulley is of the solid iron type. The whole machine is self-contained and does not depend upon its foundation for its own alignment.

The efficiency of the machine is high and is particularly apparent upon the smaller sizes usually considered most difficult to produce. Under average conditions the output per horse power is 50 % in excess of previous practice, which renders it entirely safe to state that the capacity is limited only by the ability to get the ware away from any cutting device known at this time.

Specifications

WEIGHT—8000 pounds.

LENGTH—Over all without die, 11 ft. 6¼ in.

WIDTH—Over all, 42¼ in.

HEIGHT—over all, 53½ in. To top of hopper 36½ in.

SHAFTS—Driving, 3½ in. diameter; hammered steel. Auger, 4½ in. diameter; hammered steel.

GEARS—8 in. face, 2 in. pitch; cut from solid, running in oil.

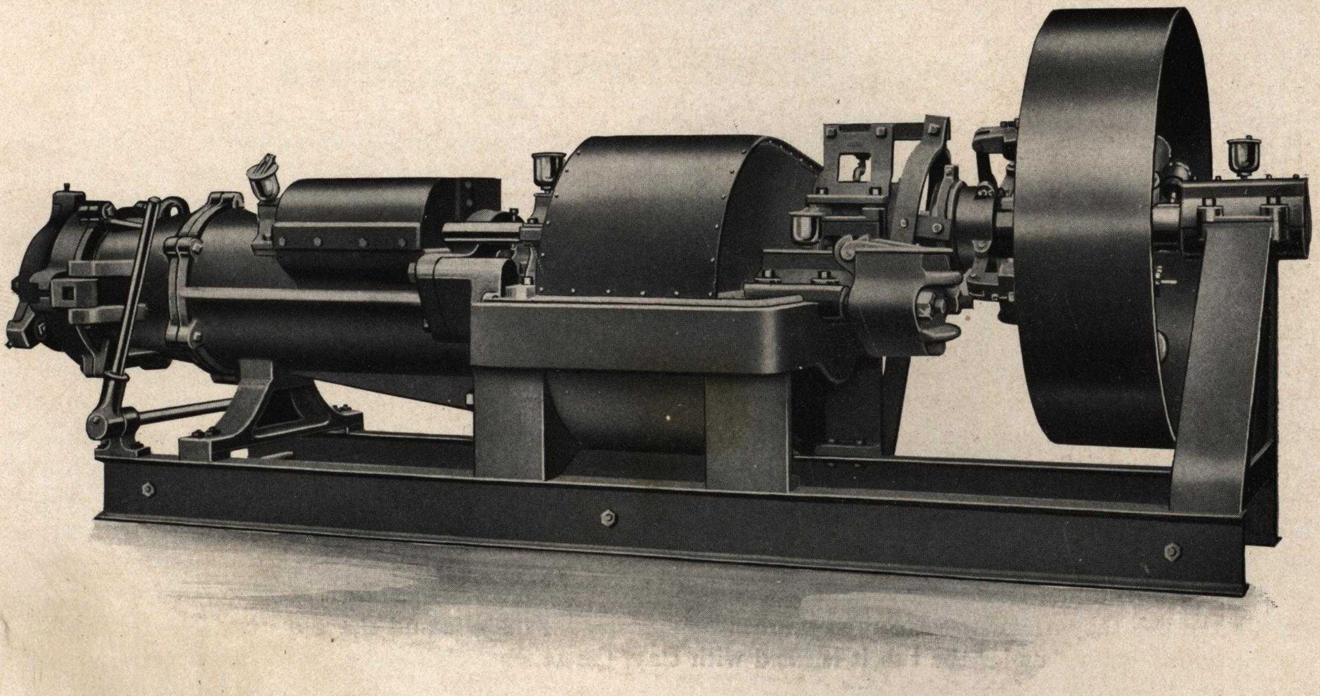
JOURNALS—12 in. long, self-oiling.

OUTBOARD BEARING for driving shaft mounted on same I beams as balance of machine.

DRIVING PULLEY—Friction clutch, type F, 29 in. pulley 45 x 12, solid iron.

SPEED OF DRIVING SHAFT—125 to 150 revolutions per minute.

DIRECTION OF REVOLUTION—Top of pulley runs from the machine.

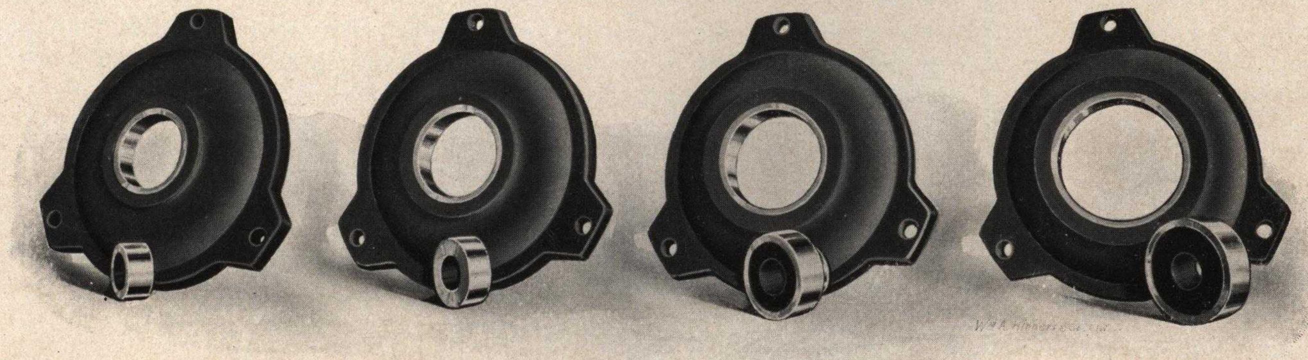


No 88 Horizontal Drain Tile Machine showing the feed roll and the adjustable self-oiling back thrust bearing, also the heavy duty disc clutch and pulley.

No. 100 Drain Tile Dies

In cases where the output is very large and the service severe these dies are recommended in place of the standard patterns described elsewhere. The funnels are made up of a heavy cast-iron body with a hardened tool-steel bushing, which when worn, can be replaced with a new one. The 3-inch and 3½-inch cores are made of solid hardened tool-steel but the larger sizes have cast-iron bodies with removable hardened tool-steel sleeves which make up the portion subject to wear. They are made in four sizes only as shown by the accompanying table, the sizes above 5-inch being provided for with the No. 51 pattern dies which are the same except that they are made of close, hard cast-iron throughout.

Finished bodies for both cores and funnels are carried in stock but the tool-steel bushings and sleeves are carried in the rough and finished to size upon receipt of specifications.



PRICE LIST.
NO. 100 DRAIN TILE DIES. SUBJECT TO DISCOUNT.

Size	Die Complete	Core			Funnel		
		Body	Sleeve	Complete	Body	Bushing	Complete
3 in.	$18.00	$....	$....	$6.00	$6.00	$6.00	$12.00
3½ in.	22.50	....	....	7.80	6.00	8.40	14.40
4 in.	27.60	3.60	8.40	12.00	6.00	9.60	15.60
5 in.	30.00	3.60	9.60	13.20	6.00	10.80	16.80

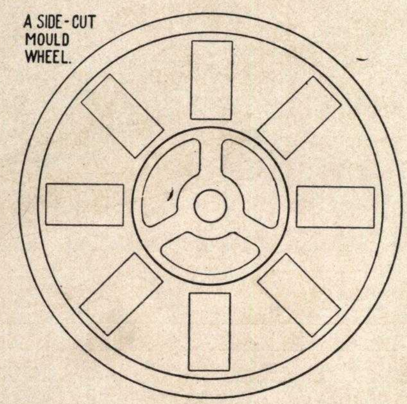
Brewer Mould Brick Machines

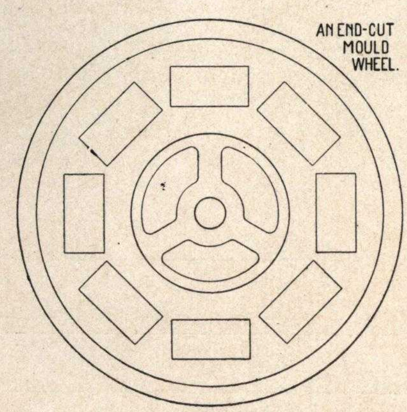
MOULD machines, or Sword machines as they are sometimes called, form stiff-tempered clay into bricks without the use of any cutting machinery whatever; that is, they mould stiff-tempered clay into bricks which may be immediately haked from six to eight inches high. Like all other machines, they are not adapted to every clay; in fact, they give the best results in clays which other stiff-mud machines will not handle; particularly weak, short, sandy surface clays and those which shrink but little in drying and burning, and from such material they make a very strong brick. In a word, they make a stronger brick from poorer material than any other process in existence.

In the general design of a mould machine there are two principal parts, a pugging cylinder in which to prepare the clay and a mould wheel by which it is formed in shape. The former consists of a cast tub, or drum, upright in position, inside of which revolves a heavy shaft having secured to it several grinding knives, set at a slight angle, which pug the clay and force it downward; while upon the extreme lower end of this shaft is attached an auger, or turtle, by which the clay is pressed into the moulds. The mould wheel consists of a large circular table containing from eight to fourteen moulds, into which plungers, with stems extending downward through guides, are fitted. These plungers have an up-and-down motion given them by a track around and upon which the stems are carried by the mould wheel as it revolves, and as they approach the tub they are allowed to drop down, leaving a mould the size and shape of the brick to be made. As this mould passes under the tub it is filled with clay, the plunger elevated a little by the press wheel to square up the bottom of the brick, and the surplus clay is removed by a cut-off knife, whereupon the plunger is raised by the track, leaving the finished brick upon the surface of the mould-wheel, ready to be taken off by hand or transferred to an off-bearing table by a mechanical device for that purpose. One mould follows another around under the tub, and all motions are continuous and rotary. The face of the plungers and the inside of the moulds are lubricated with oil so that the clay does not stick to them, and to prevent the brick from sticking together in the hake.

Mould Wheels

THE mould-wheel is the most important part of the machine, having heavy duty to perform under trying circumstances; consequently, great care is used in the selection of material and methods of manufacture. The body consists of a one-piece casting, just as hard as it can be made and permit proper machining, and the moulds it contains are lined with crucible steel plates, hardened and ground. These plates are rabbeted together and secured in place by metal wedges, with all surrounding space swaged full of soft metal, making it impossible for them to work loose. The guides for the plunger stems are securely attached with cap screws which are locked in position to prevent backing out, although they can be removed if necessary. The plungers are made of the same material as the body of the wheel, accurately planed and fitted, having the ends of the stems chilled to withstand the wear caused by the air travel upon the track.

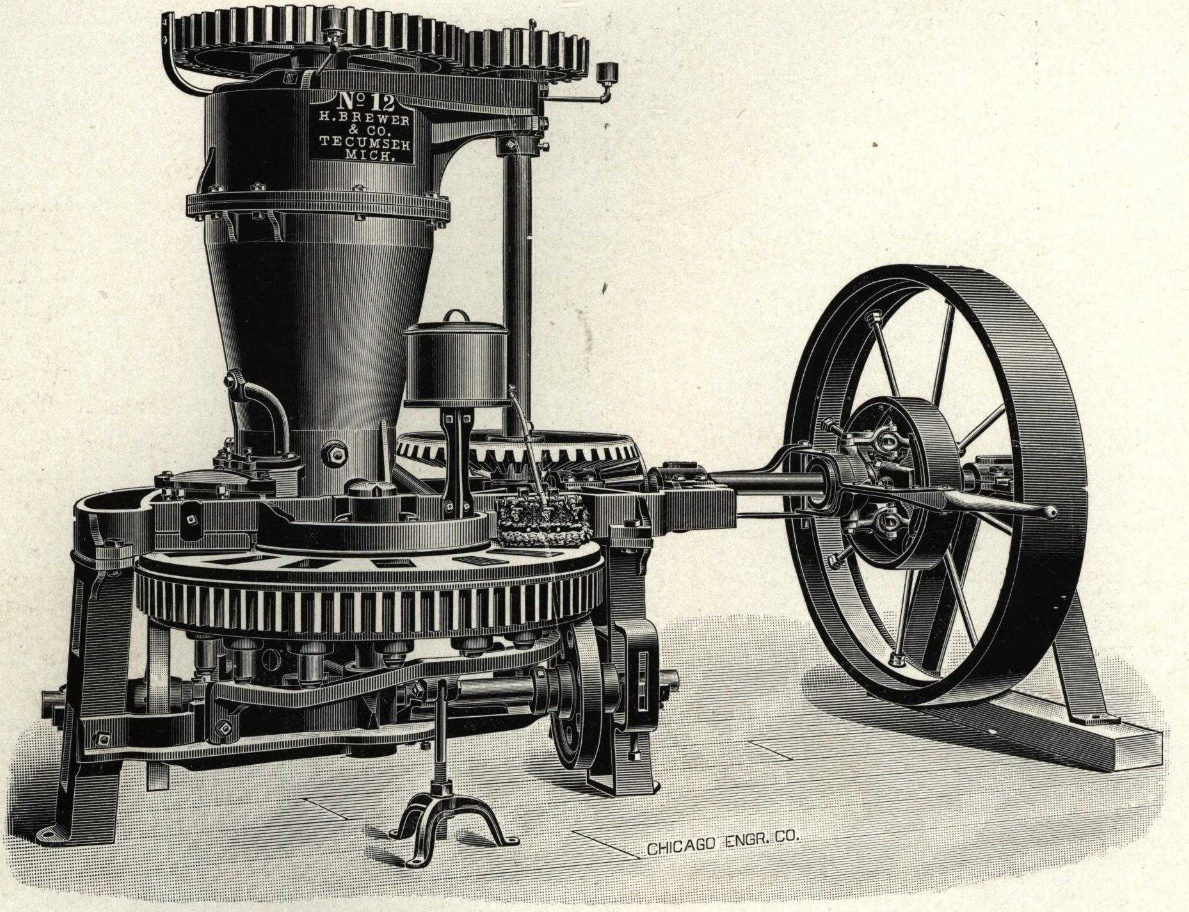




Two styles of mould-wheels are produced, side-cut and end-cut (difference shown by the sketches herewith), either of which may be used with the No. 8 machine, while with the No. 12, the side-cut pattern only is adaptable. No. 8 side-cut, No. 8 end-cut, and No. 12 side-cut wheels are carried in stock with the following sizes of moulds, viz., 9 x 4⅜, 8¾ x 4¼, 8⅝ x 4⅛, 8½ x 4¹⁄₁₆; but other sizes can be made in about twenty days. Orders for mould-wheels should specify the style of wheel (side-cut or end-cut) and the size of mould desired.

Off-Bearing Tables

WITH No. 8 machines, having end-cut mould-wheels, a transfer device and off-bearing table can be furnished, by means of which the brick are delivered upon a belt. This apparatus consists of a metal disc, A (page 23), overlapping the mould-wheel and revolving from the wheel toward the off-bearing belt, B, in such a manner that the bricks, having been guided upon it by the felt-covered rolls, X, are carried around and delivered to the belt by the large roll, C. These off-bearing tables are built in two styles, one to deliver on a line parallel with the driving shaft of the brick machine, and the other at right angles to that shaft. The former is illustrated by the engraving on page 23. Orders for machines with off-bearing tables should specify which style is desired.



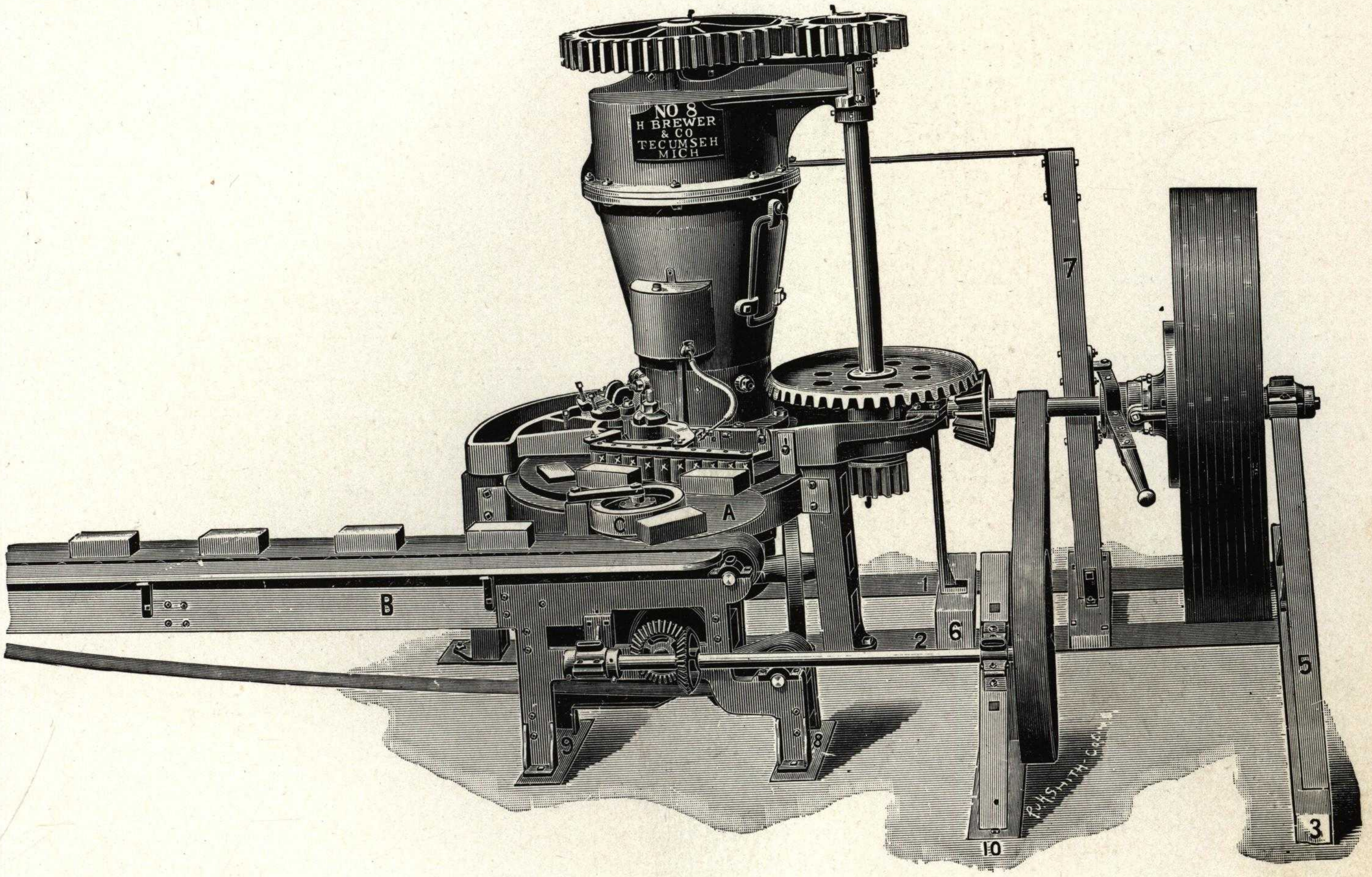
No. 12 Mould Brick Machine

THIS is the largest, strongest, and heaviest mould machine produced, and has great advantages over anything of the kind previously placed upon the market. It is furnished with side-cut mould-wheel only, transfer device and off-bearing table not being adapted to it. In its construction only the best material is employed, and all parts are made as nearly proof against wear as is possible by the liberal use of special steel and chilled iron. The upthrust of the pugging shaft is taken by two split collars, which may be readily replaced at a very small cost when occasion requires, and the lower end of the pugging shaft which runs in the centering box is covered with a ring which takes the wear and prevents damage to the more expensive parts. It is the intention to have in stock at all times mould-wheels for these machines with the following sizes of moulds, viz., 9 x 4⅜, 8¾ x 4¼, 8⅝ x 4⅛, and 8½ x $4\frac{1}{16}$; but other sizes can be built to order in about twenty days after receipt of specifications. The depth of the mould is adjustable, so that any thickness of brick up to 2¾ inches can be made as desired. This machine makes brick only, and is not adapted to the manufacture of any other kind of ware.

Specifications

WEIGHT—10,000 pounds.
HEIGHT—Over all, 7 ft. 8 in.
  From bottom of leg to feeding point, 5 ft. 9 in.
WIDTH—Over all, 5 ft.
LENGTH—Over all, 10 ft. 6 in.
SHAFTS—Driving, 2⅞ in. diameter.
  Outside upright, 3½ in. diameter.
  Pugging, 3½ in. square.

GEARS—5 in. face, 2 in. pitch, semi-steel.
JOURNAL BOXES—6 to 10 in. long.
DRIVING PULLEY—Friction clutch, 60 in. diameter, 10 in. face.
DIRECTION OF REVOLUTION—Over from right to left as observer faces outer end of shaft.
SPEED—95 to 120 revolutions per minute.
CAPACITY—3,500 to 5,000 bricks per hour.



No. 8 Mould Brick Machine

THE engraving above illustrates the No. 8 Mould Brick Machine with end-cut mould-wheel, transfer device, and off-bearing table, the latter being arranged to deliver on a line parallel with the driving shaft of the brick machine. Either side-cut or end-cut mould-wheels can be furnished for these machines, and the transfer device with off-bearing table to deliver as shown in cut or on a line at right angles to the driving shaft may be used with the end-cut wheel if desired, while with side-cut wheels these attachments are not furnished. Both side-cut and end-cut mould-wheels for these machines are carried in stock only with moulds of the following standard sizes, viz., 9 x 4⅜, 8¾ x 4¼, 8⅝ x 4⅛, and 8½ x 4$\frac{1}{16}$; but other special sizes can be furnished to order. Mould machine orders should state whether mould-wheel is to be side-cut or end-cut; the size of mould desired; whether or not off-bearing table is to be used, and, if so, whether it is to deliver at right angles to, or parallel with, the driving shaft.

Specifications

WEIGHT—8,400 pounds.

HEIGHT—Over all, 7 ft. 2 in.
From bottom of leg to feeding point, 5 ft. 6 in.

WIDTH—Over all, 4 ft. 6 in.

LENGTH—Over all, 10 ft.

SHAFTS—Driving, 2⅞ in. diameter.
Outside upright, 3½ in. diameter.
Pugging, 3½ in. square.

GEARS—5 in. face, 2 in. pitch, semi-steel.

JOURNAL BOXES—8 to 10 in. long.

DRIVING PULLEY—Friction clutch, 60 in. diameter, 10 in. face.

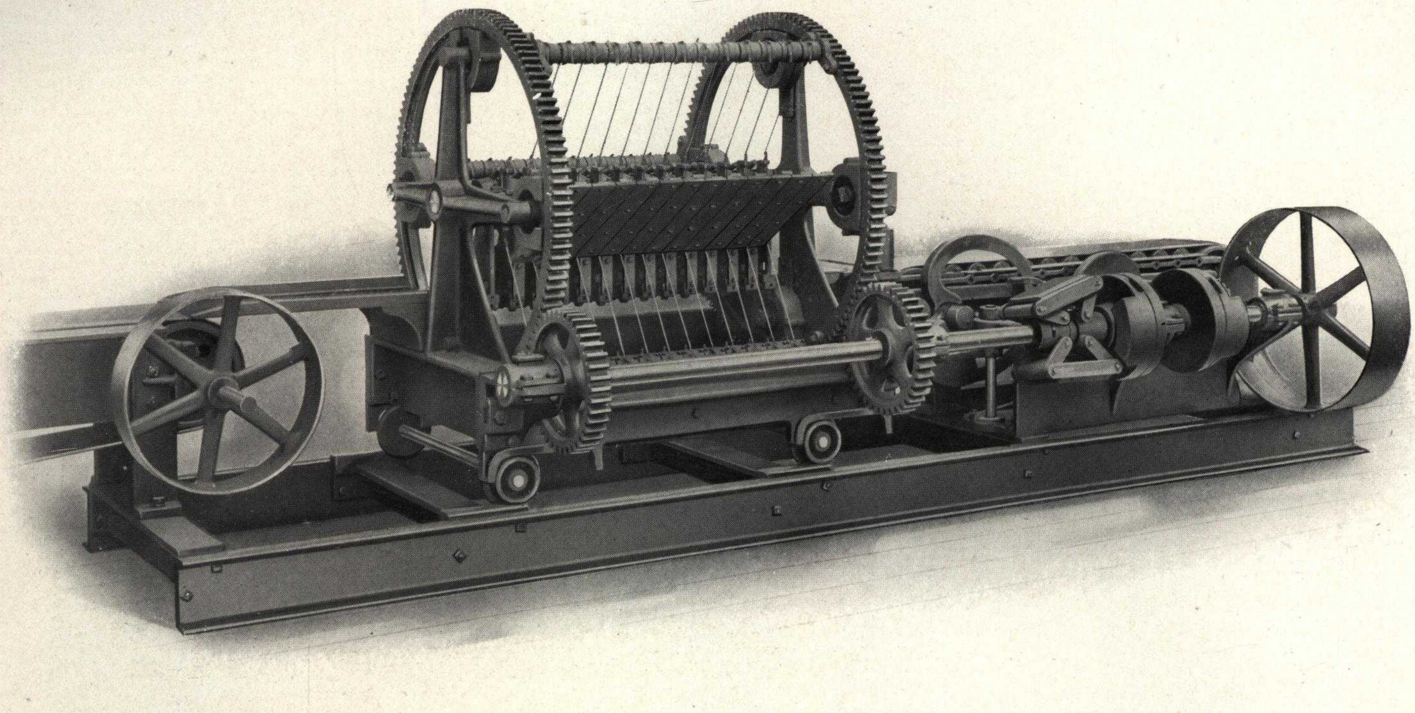
DIRECTION OF REVOLUTION—Over from right to left as observer faces outer end of driving shaft.

SPEED—80 to 130 revolutions per minute.

CAPACITY—2,500 to 3,000 bricks per hour.

WEIGHT OFF-BEARING TABLE—925 pounds.

LENGTH OFF-BEARING TABLE—12 ft.



No. 36 Rotary Automatic Brick Cutter (Side Cut)

THE extreme simplicity of this machine, its small number of parts, none of which are delicate, the ease and smoothness of all its motions, and its construction being entirely of iron and steel, insure its durability under most severe operation. It is of the Rotary Pattern, having the axis of the reel so located that the wires have a downward shearing passage through the clay, producing bricks one end and one face of which are entirely free from any roughness whatever, while the other edges are subject to the least possible disfiguration. To still further promote this condition a wire cleaning device is employed by means of which any substance adhering to the wires after passage through the clay is removed before they again enter it.

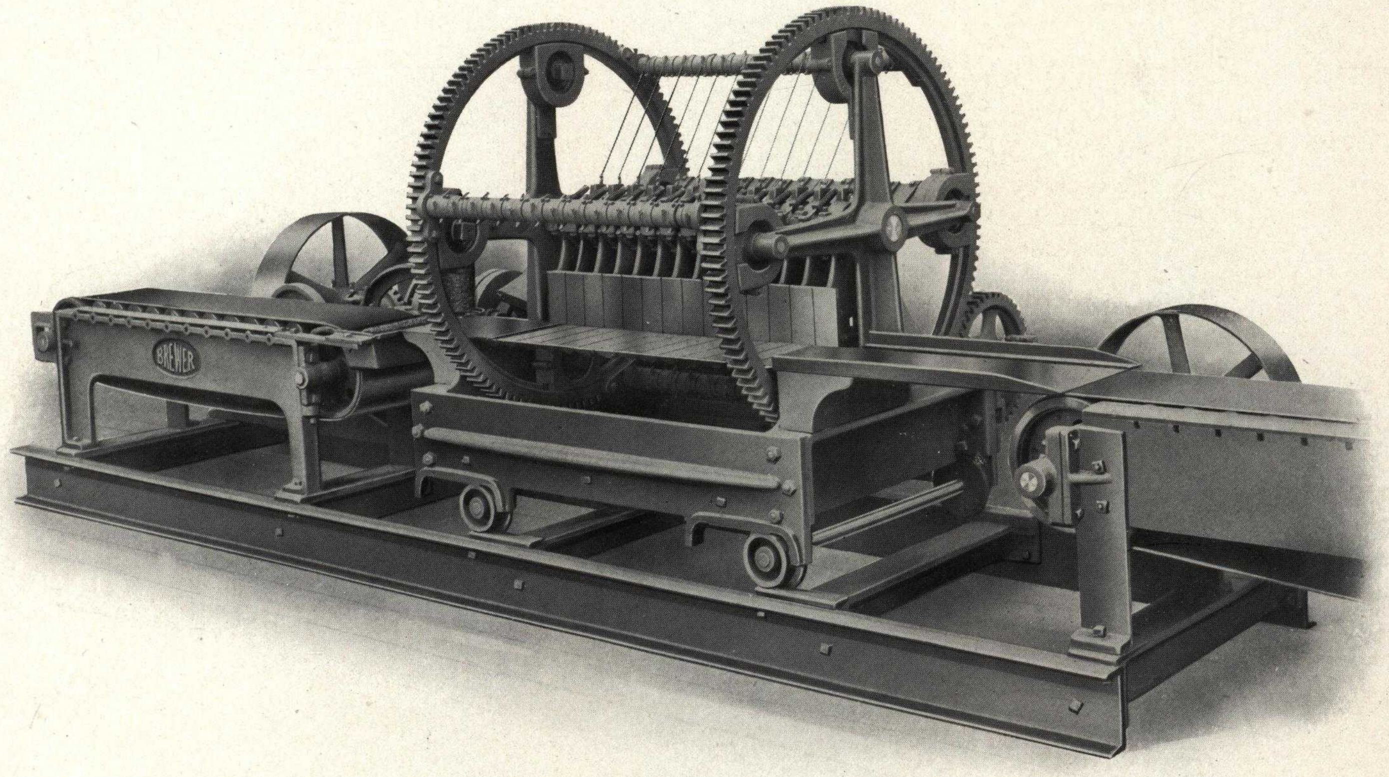
The power required to operate both the cutter and the off-bearing table is derived entirely from a countershaft furnished as a part of the machine and located above it upon the ceiling, and no work whatever is done by the moving column of clay except that of measuring itself and tripping the clutches.

In the operation of the machine, the column of clay issues from the die of the brick machine upon the belt, which runs over a measuring pulley the diameter of which is such that one revolution of it will run off a sufficient length of the column to make twelve bricks. Attached to the shaft of this measuring pulley is also a device which permits the cutting table to move forward at the same speed as the moving column, trips the clutch which applies power to the wires, and also trips the clutch which returns the table to its original position. The bricks, in passing to the off-bearing table, are separated from each other and distributed throughout the length in such a manner that they are easily removed.

The design of the wire-holder is such that broken wires may be easily replaced while running at maximum speed. There are no screws or thumb-nuts to be backed off or levers to manipulate before a new wire can be put on, and variation in length of the wires has no effect on the ease or speed of replacing them. The tension spring is located in the center wire-holder, and the outer holder is provided with an internal ratchet which permits it to revolve freely in one direction but prevents turning in the other. The outer holder also carries four wire hooks, one of which is always in a position ready to receive the loop of the wire.

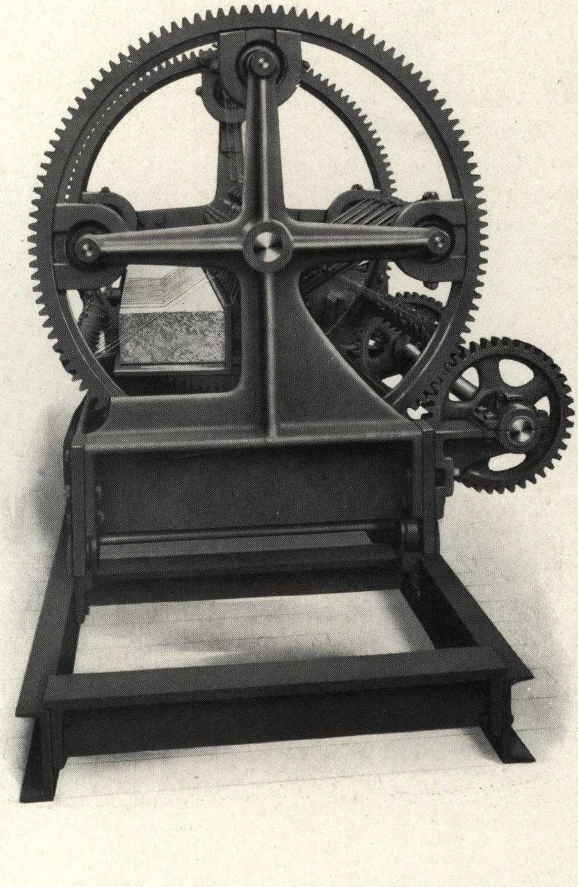
In cases where more than one thickness of cut is produced with a single machine the changes from one size to another may be made quickly and with the removal of very few parts.

The standard machine will cut a column, the cross-section of which is 10 inches or less horizontal measurement by 5 inches or less vertical measurement.



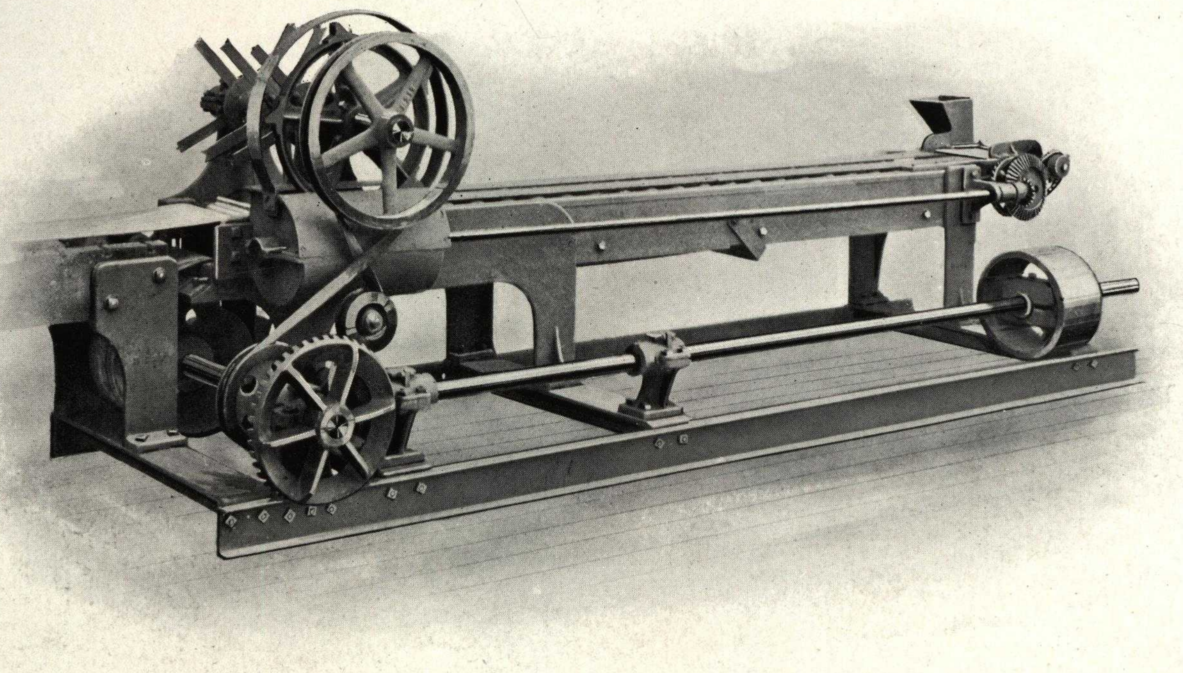
It is the intention to keep in stock at all times completed standard right-hand cutters, as shown by the illustrations, for 2½ inches and 2⅝ inches cut, and machines in process of manufacture which can be readily converted into left-hand patterns with the driving mechanism on the opposite side from that shown by engraving or to any other thickness of cut desired by the purchaser.

In rating the capacity of this cutter at 5,000 bricks per hour, it is intended to provide liberally for unfavorable conditions which frequently surround such a machine. It will cut with ease and without any injury whatever to itself at the rate of 7,500 per hour under ordinary favorable conditions, but specifications of capacity are made low enough to permit an absolute guaranty of reliable and satisfactory service irrespective of local circumstances.



Specifications

Weight—Complete with 12 ft. off-bearing table, 4,500 pounds.
Of 12 ft. off-bearing table, 380 pounds.
Length—Without off-bearing table, 10 ft. 6 in.
Standard off-bearing table, 12 ft. long.
Width—Over all, 50 in.
Height—Over all, 52 in.
Countershaft Speed:
6,000 bricks per hour, 160 revolutions per minute.
5,000 bricks per hour, 140 revolutions per minute.
4,000 bricks per hour, 115 revolutions per minute.
2,000 bricks per hour, 75 revolutions per minute.
Driven pulley on countershaft, 16 in. diameter, 6 in. face.
Capacity—5,000 bricks per hour.



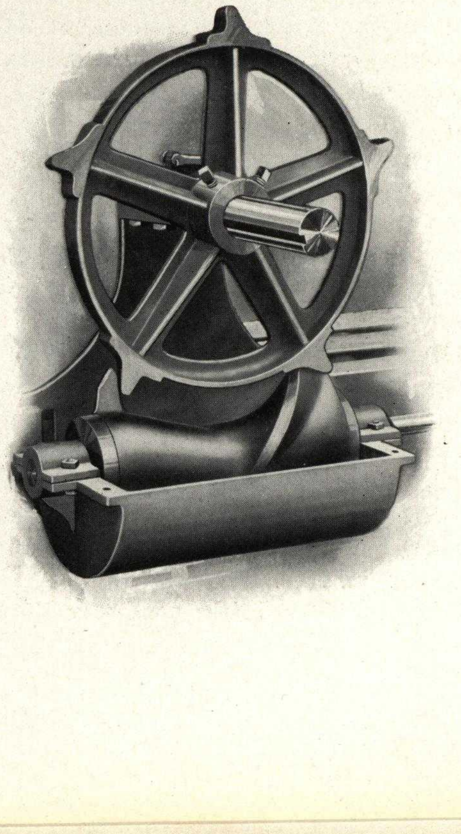
No. 14 Automatic Brick Cutter (End-Cut)

THIS design incorporates all those desirable features of simplicity, strength, durability, accurate government, etc., in a manner seldom found in such machines, especially those intended to cut the product of double-stream dies. The cam shown by the engraving below is of a peculiar and original form, affording much more accurate and positive control than the cams or mutilated gears usually employed for the purpose of guiding the wires upon the reel-arms straight through the column; and the transfer device for removing the brick to the off-bearing belt is strikingly simple, yet most effective in its action.

As ordinarily built this machine is adapted to the cutting of two columns, issuing side by side on edge a short distance apart; but it is capable of cutting a single column issuing on edge or flatwise as circumstances may require.

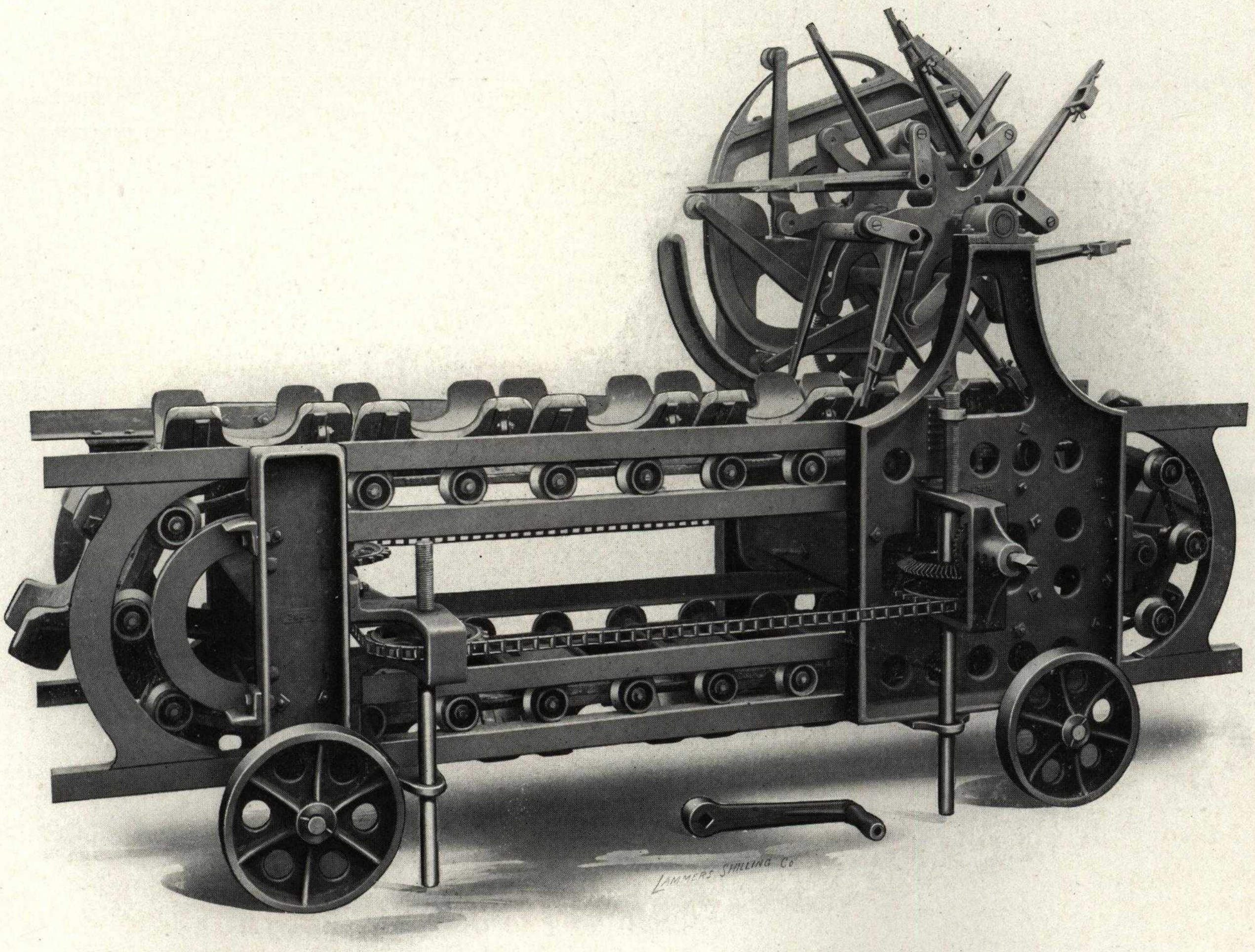
The wires are short, attached to spring holders, not easily broken, but quickly and easily replaced while the machine is running. They cut down through the column upon a flexible belt, making a smooth straight cut with the least possible liability of breaking out the bottom edges of the bricks.

The standard pattern sander distributes sand upon the bottom edge of the column only, but at a slight advance in price a suitable device for sanding all sides of the column will be furnished.



Specifications

Weight—2,200 pounds.
Length—Over all for double column, 22 ft.
Over all for single column, 25 ft.
Off-bearing table, 12 ft.
Width—Over all, 3 ft. 3 in.
Height—To top of belt, 2 ft.
Speed of Driving Shaft—Proportional to output.
Direction of Revolution—Over from left to right as observer faces delivery end.
Capacity—15,000 or less brick per hour.



No. 77 Automatic Tile Cutter

THIS machine has no moving guide arms attached to the carriers and therefore the ware is much more easily and rapidly removed from it. The reel and the carriers are geared together and a one-inch slip-belt relieves the column of all work except that of government. The column is supported by the carriers close to the die, and the carriers are quickly adjustable to conform with all the different sizes between 3 in. and 8 in. inclusive.

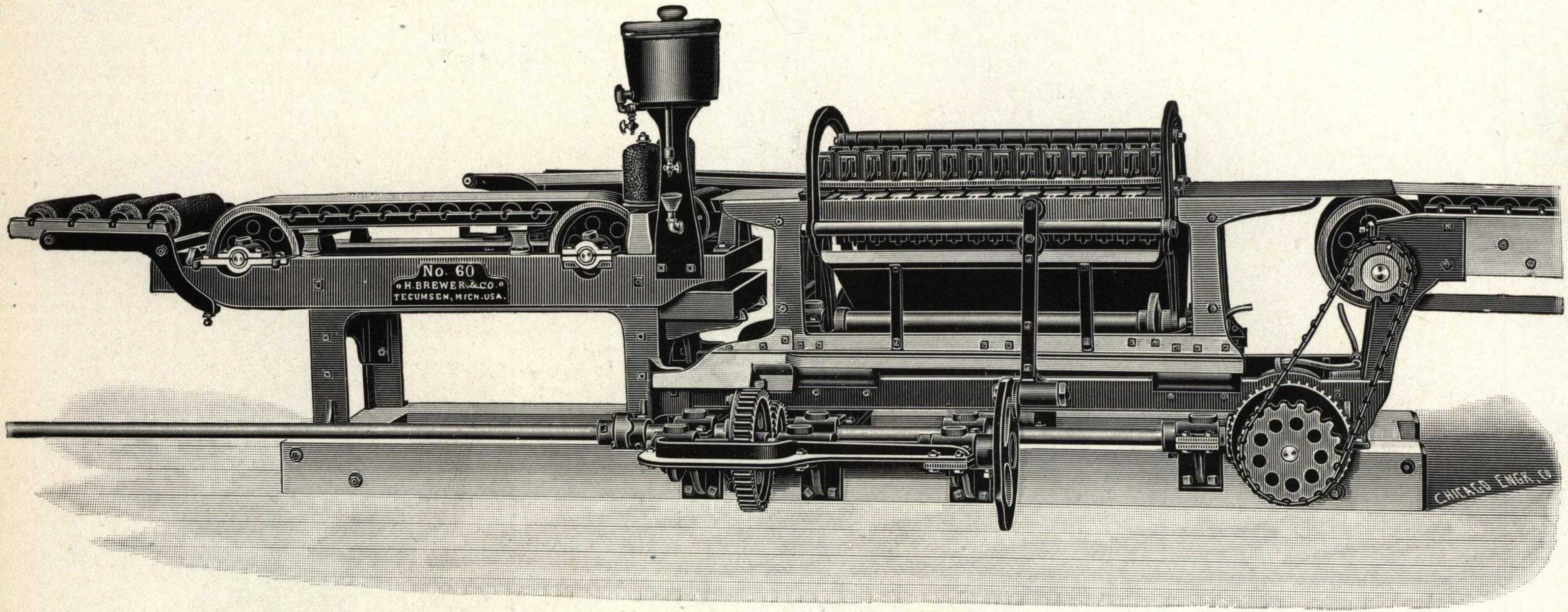
In order that the cutter may be quickly moved to and from its position in front of the machine, it is mounted on wheels, and by means of the removable crank quickly adjusted to the proper height for the particular size to be cut.

The construction of the machine is of excellent character, and no reasonable expense has been spared to secure accuracy, speed, durability, and convenience of operation.

Stock lengths of cut, 13¼ in. and 13½ in. Other lengths to order. Bevel geared countershaft included in price.

Specifications

WEIGHT—Net, 1,850 lbs.; crated, 2,225 lbs.
LENGTH—Over all, 8 ft. 8 in.
WIDTH—Over all, 3 ft. 11 in.
HEIGHT—Over all, 4 ft. 7 in. From floor to center of tile die, 2 ft. 6 in.
COUNTERSHAFT PULLEY—12 in. diameter, 4 in. face.
SPEED OF COUNTERSHAFT PULLEY — 100 revolutions per minute.



No. 61 Automatic Brick Cutter

No. 61 and No. 65 Automatic Brick Cutter

THESE cutters are of the oscillating type and very simple in design. They have short wires which can be replaced while running, and the power required to cut the bricks and return the table is not taken from the moving column of clay. They are primarily side-cut, but in a great many cases are used for cutting a variety of ware, including side-cut brick, end-cut brick, hollow brick, hollow blocks, and special shapes.

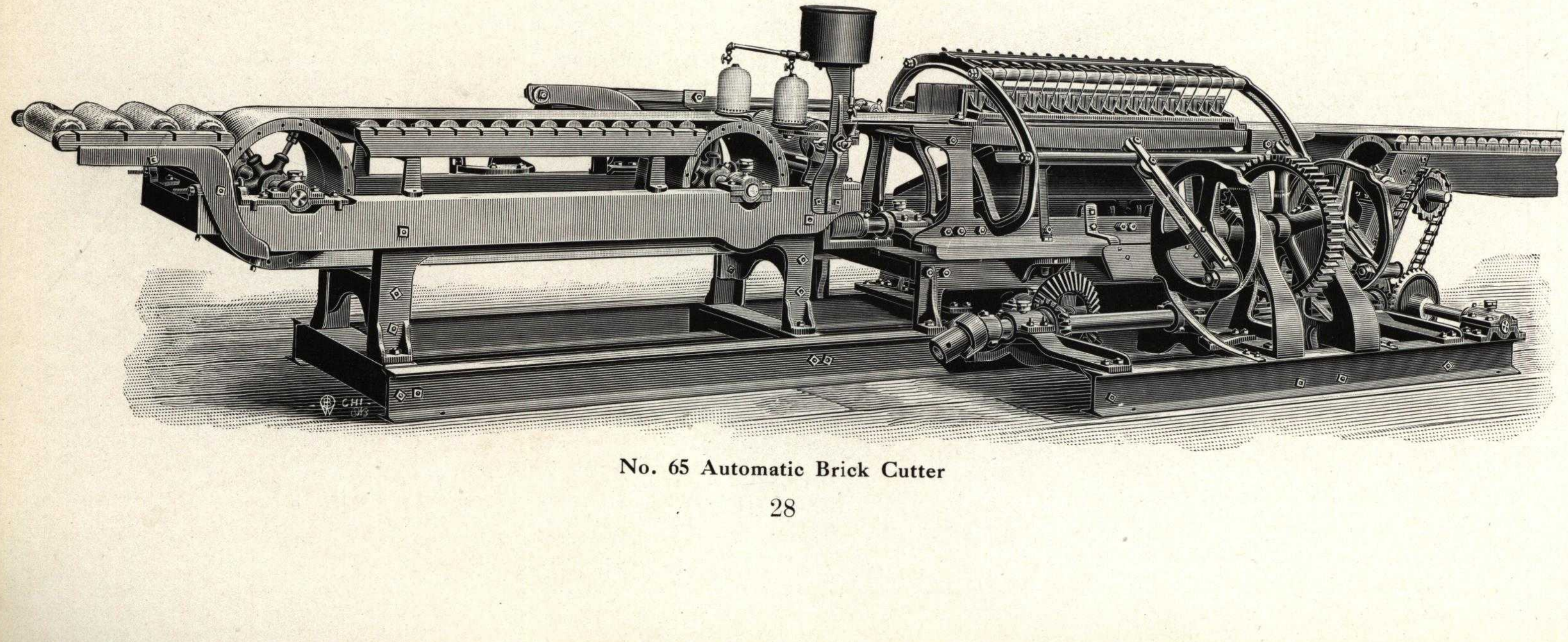
Specifications

NUMBER 61

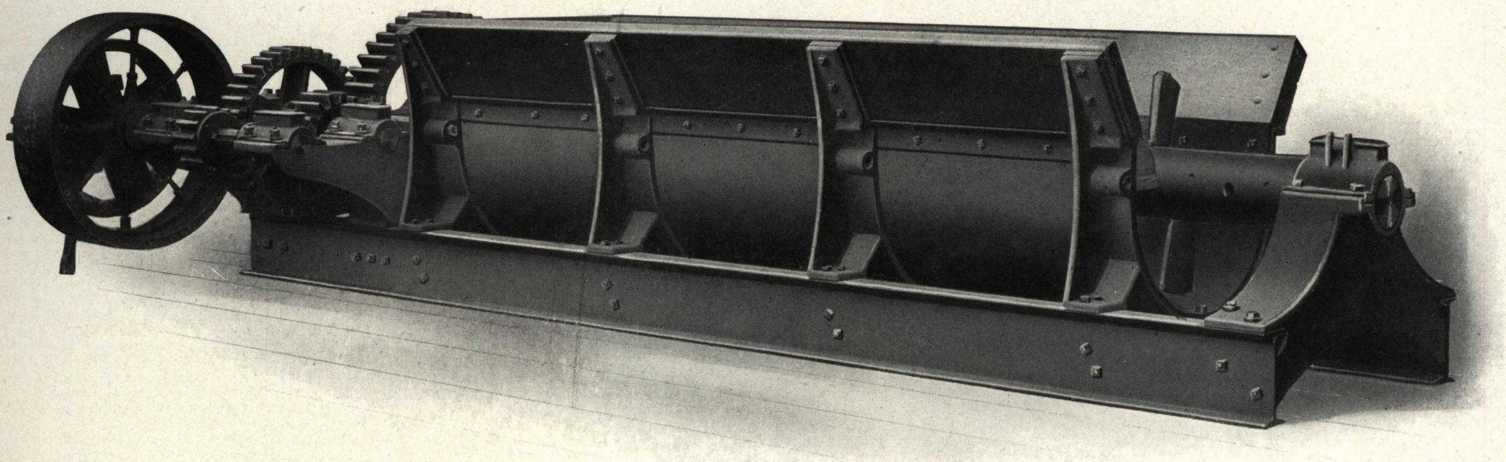
WEIGHT—2,700 pounds.
LENGTH—Over all, 24 feet.
Off-bearing table, 12 feet.
WIDTH—At widest point, 3 ft. 6 in.
HEIGHT—To lower side of clay column, 2 ft. 5 in.
SPEED OF DRIVING SHAFT—Proportional to output.
DIRECTION OF REVOLUTION—Over from left to right as observer stands facing delivery end.
CAPACITY—5,000 or less side-cut brick per hour.

NUMBER 65

WEIGHT—4,500 pounds.
LENGTH—Over all, 35 feet.
Off-bearing table, 18 feet.
WIDTH—At widest point, 4 ft. 6 in.
HEIGHT—To lower side of clay column, 2 ft. 6 in.
SPEED OF DRIVING SHAFT—Proportional to output.
DIRECTION OF REVOLUTION—Over from left to right as observer stands facing delivery end.
CAPACITY—15,000 or less side-cut brick per hour.



No. 65 Automatic Brick Cutter



No. 17 Granulator (Pushing)

No. 17 and No. 18 Granulators

IT is intended that the engravings and specifications will afford a clear idea of the size and weight of these machines, but to give a better understanding of the design and construction the following points are mentioned: The shell is rolled from a single sheet of 5/16 in. steel, is reinforced upon its upper edges with steel angles, and supported at four equal points in its length by heavy cast saddles. These saddles also carry the upper extensions of the shell, which are made of 3-inch seasoned oak plank and serve as a beginning for the construction of the hopper, built of plank, usually employed. The pugging knives are forged from hard high-carbon steel, having blades 10 inches long and round shanks which are mortised into the shaft. They are secured at any desired pitch by means of taper keys, thus making each one independently adjustable and subject to removal without disturbing any other knife and without removing the shaft from its bearings.

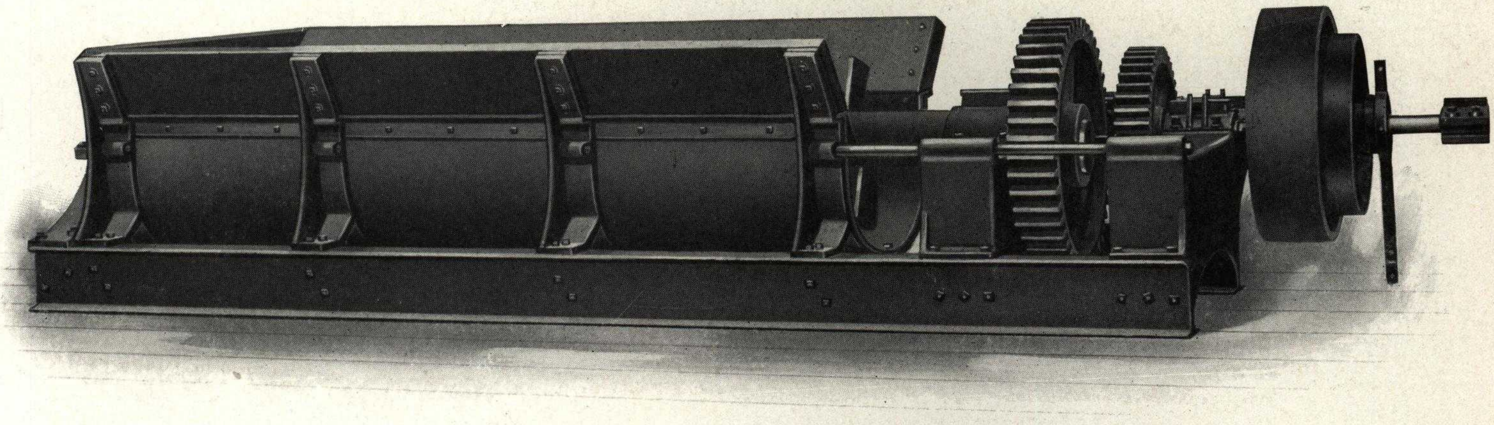
The thrust bearing is of the Marine pattern, which consists of square elevations running around the shaft at the point where it is enclosed in the bearing, with a grooved box and cap to fit; giving much more bearing surface than is possible with collars of reasonable size, and excluding all grit and foreign substance from between the surface of contact.

The top and delivery end are entirely open, but by adjusting the knives to the proper pitch it is possible to control the length of time the clay is kept in the machine and the rate of delivery, irrespective of the speed at which the machine is driven or the amount of clay there may be in the hopper above it.

With the exception of the outboard bearing these granulators are self-contained, being mounted upon heavy 12-inch steel I-beams which run the entire length with rigid cross bracing at seven points, and do not, therefore, depend upon their foundation for their own alignment.

These two machines are the same in every particular except the manner in which they are assembled; the No. 17, or pushing pattern, being so arranged that it delivers the material at the end opposite the gear frame, while the No. 18, or pulling pattern, discharges between the end of the shell and the gear frame. Either pattern can be converted into the other without extra parts of importance and by reversing the driving shaft in its bearings the driving pulley may be located at almost any desired point in relation to the balance of the machine. See specifications on page 31.

The No. 19 and No. 20 Granulators are the same as the above machines, except in that they are bevel instead of spur geared.



No. 18 Granulator (Pulling)

No. 17 and No. 18 Granulators

THE purpose of a Granulator is threefold: serving as a receptacle into which large quantities of clay may be dumped at a time, reducing the size of the large lumps, and furnishing a uniform feed for the disintegrator, crusher, pug-mill, or any other machine which may succeed it. It is indispensable, from an economical point of view, in all plants, except very small ones, where surface clays or plastic shales are used, and even in small plants where hoists and cars are employed to bring up the material and a pug-mill for tempering, it will effect a great saving in expense. It is not designed as a mixing, pugging, or tempering machine, although sometimes recommended and used as such, but all of those operations are promoted to a great extent in the performance of the work it is intended to do.

The position occupied by a Granulator is such that it has very severe conditions to meet, and its design and construction must be more than ordinarily strong and rigid to permanently and successfully withstand the frequent, sudden, and violent stresses to which it is subject; clay in the crudest form being delivered to it in large quantities at irregular intervals and containing stones and large lumps which are sometimes frozen.

Specifications of both No. 17 and No. 18 Granulators

WEIGHT—18,000 pounds.

LENGTH—Over all, as shown, 21 ft. 6 in. With pulley shaft reversed, 18 ft. 4 in.

WIDTH—Over all, 7 ft. 10½ in.

HEIGHT—Over all, 4 feet.

SHAFTS—Granulating, 10 in. diameter, semi-steel.
Intermediate, 4 in. diameter, steel.
Driving, 3½ in. diameter, steel.

GEARS—First reduction, 2¼ in. pitch, 6 in. face, semi-steel.
Second reduction, 2¾ in. pitch, 8 in. face, semi-steel.

JOURNALS—12 and 14 in. long.

SHELL—12 feet long.

OUTBOARD BEARING—Pillow block.

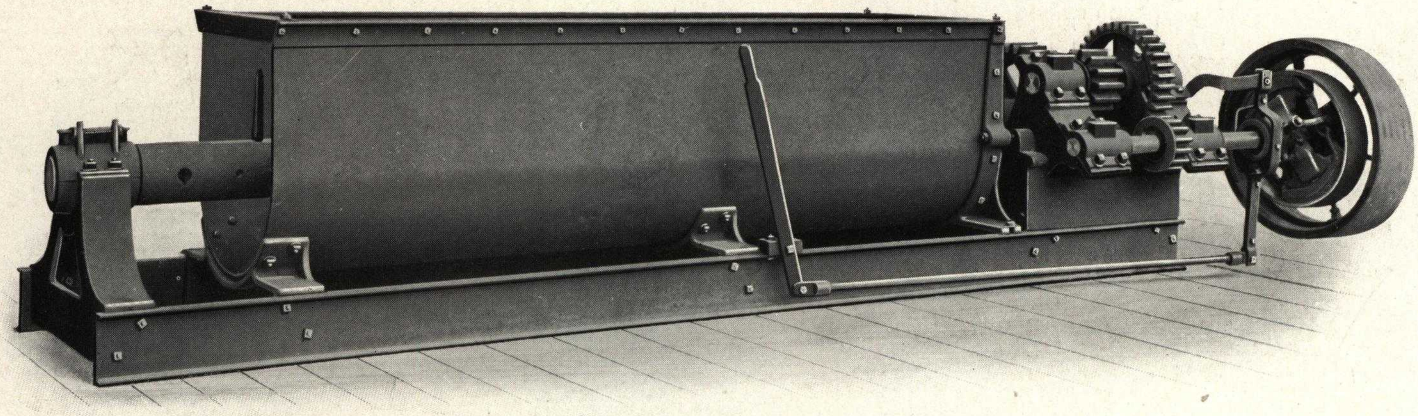
KNIVES—Forged steel, 48 in number.

DRIVING PULLEY—Friction clutch, Type C; 42 in. diameter, 12 in. face.

SPEED OF DRIVING SHAFT—270 revolutions per minute.

DIRECTION OF REVOLUTION—Over from left to right as observer faces pillow block.

CAPACITY—Material for 10,000 or less bricks per hour.



No. 45 Pug Mill (Pushing)

No. 45 (Pushing) and No. 44 (Pulling) Pug Mills

THESE two Pug Mills are identical in every respect, except the method in which they are assembled. The No. 45 (Pushing) discharges at the end opposite the driving pulley, while the No. 44 (Pulling) discharges between the shell and the gear frame as shown by the illustration upon page 33. One pattern can be converted into the other without the addition of any important parts and without disturbing the alignment of any of the bearings.

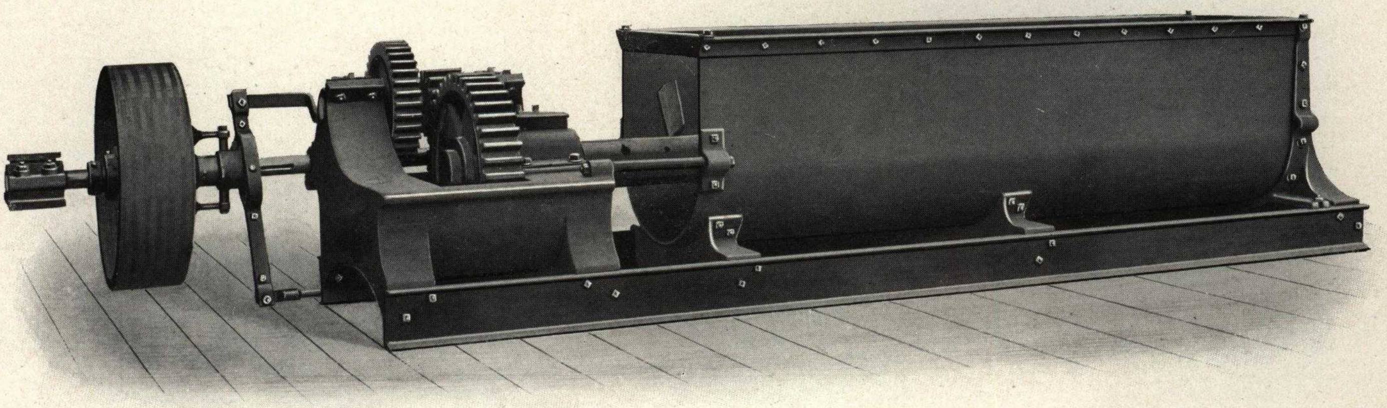
The construction is very heavy and the design is such that they may be used as Granulators in cases where the heavier machines of that class are not required. As pug-mills, however, they are heavy-duty machines with much more than ordinary strength and rigidity.

The gear frames are cast in one piece and so designed that all gears come below the level of the top of the shell. The knives are forged from hard, high-carbon steel, with round shanks mortised into the shaft and held in position by keys in such a manner that each one is independently adjustable for pitch. The shell is rolled from a single sheet of ¼-inch steel plate, and the upper edges are reinforced with steel angles. The machines are rigidly mounted upon heavy steel channels, and are self-contained with the exception of the outboard bearing.

Especial attention is directed to page 33 for a further description of the design.

Specifications

WEIGHT—8,000 pounds.
LENGTH—Over all, 17 feet.
WIDTH—Over all, 5 feet.
HEIGHT—Over all, 3 ft. 3 in.
SHAFTS—Pugging, semi-steel, 7½ in. diameter.
  Intermediate, steel, 3½ in. diameter.
  Driving, steel, 3 in. diameter.
GEARS—First reduction, 4¼ in. face, 1¾ in. pitch, semi-steel.
  Second reduction, 6 in. face, 2¼ in. pitch, semi-steel.
JOURNALS—9 in. to 12 in. long.
SHELL—10 ft. long, 30 in. diameter, 33 in. deep.
OUTBOARD BEARING—Pillow Block.
KNIVES—Forged steel, 34 in number.
DRIVING PULLEY—Friction clutch, Type B, 34 in. diameter, 10 in. face.
SPEED OF DRIVING SHAFT—250 to 300 revolutions per minute.
DIRECTION OF REVOLUTION—Over from left to right as observer faces clutch.
CAPACITY—Material for 7,500 bricks per hour.



No. 44 Pug Mill (Pulling)

No. 45 (Pushing) and No. 44 (Pulling) Pug Mills

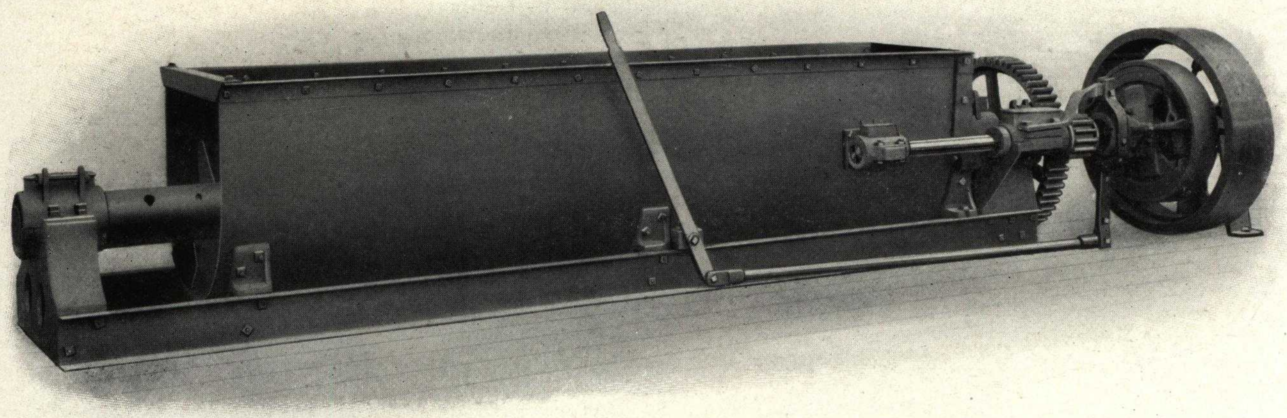
IN addition to all the advantages of the ordinary open top, open front, pug-mills, these machines have all the advantages of the closed top, closed front patterns without the disadvantages of either. The design is such that the pitch of each knife is adjustable and independent of every other, and therefore it is easily possible to set a few front knives with less pitch than those behind them and thus hold the clay in the mill the desired length of time; to run the mill as nearly full of clay as required; and to secure at all times a uniform and regular discharge of clay irrespective of speed or of any irregularity there may be in feeding.

When running, ordinary open front pug-mills will be found fairly full of clay at the receiving end and nearly empty at the discharge end. Closed front mills are generally full to overflowing at the discharge end and comparatively empty at the receiving end. These mills will be found running full throughout the entire length, although it is possible to set the front knives so flat that they will spill over in front.

Additional details relative to these pug-mills will be found on page 35.

Specifications

WEIGHT—8,000 pounds.
LENGTH—Over all, 17 feet.
WIDTH—Over all, 5 feet.
HEIGHT—Over all, 3 ft. 3 in.
SHAFTS—Pugging, semi-steel, 7½ in. diameter.
  Intermediate, steel, 3½ in. diameter.
  Driving, steel, 3 in. diameter.
GEARS—First reduction, 4¼ in. face, 1¾ in. pitch, semi-steel.
  Second reduction, 6 in. face, 2¼ in. pitch, semi-steel.
JOURNALS—9 in. to 12 in. long.
SHELL—10 ft. long, 30 in. diameter, 33 in. deep.
OUTBOARD BEARING—Pillow Block.
KNIVES—Forged steel, 34 in number.
DRIVING PULLEY—Friction clutch, Type B, 34 in. diameter, 10 in. face.
SPEED OF DRIVING SHAFT—250 to 300 revolutions per minute.
DIRECTION OF REVOLUTION—Over from left to right as observer faces clutch.
CAPACITY—Material for 7,500 bricks per hour.



No. 34 Pug Mill (Pushing)

No. 34 (Pushing) and No. 35 (Pulling) Pug Mills

THESE two mills are of practically the same general design as the No. 44 and No. 45 previously described. They are of somewhat smaller capacity, and have single instead of compound gearing, but in every other respect involve the same high-grade construction as the larger models.

Both mills are made from the same patterns, the only difference being in the method of assembling the parts. The No. 34 (Pushing) discharges at the end opposite the pulley, while the No. 35 (Pulling) discharges between the gear frame and the end of the shell.

The knives are forged from hard high-carbon steel. They have round shanks, and are mortised into the shaft, where they are held in position with keys. Each one is independently adjustable for pitch, and by proper arrangement may be made to hold the mill full of clay, which will be uniformly discharged irrespective of irregularity of feeding.

The thrust bearing is of the grooved Marine pattern, which provides more surface than can be obtained from collars or plates of reasonable size, and at the same time excludes grit and foreign matter much more effectively than is possible with open thrust surfaces located as such a bearing has to be upon a pug-mill.

Specifications

WEIGHT—5,400 pounds.

LENGTH—Over all, 16 feet.

WIDTH—Over all, 4 ft. 2 in.

HEIGHT—Over all, 35 inches.

SHAFTS—Pugging, semi-steel, 7½ in. diameter. Driving, steel, 2½ in. diameter.

GEARS—4½ in. face, 1½ in. pitch, ratio 4½ to 1, semi-steel.

JOURNALS—8 to 12 in. long.

SHELL—10 ft. long, 24 in. diameter, 29 in. deep.

OUTBOARD BEARING—Floor stand.

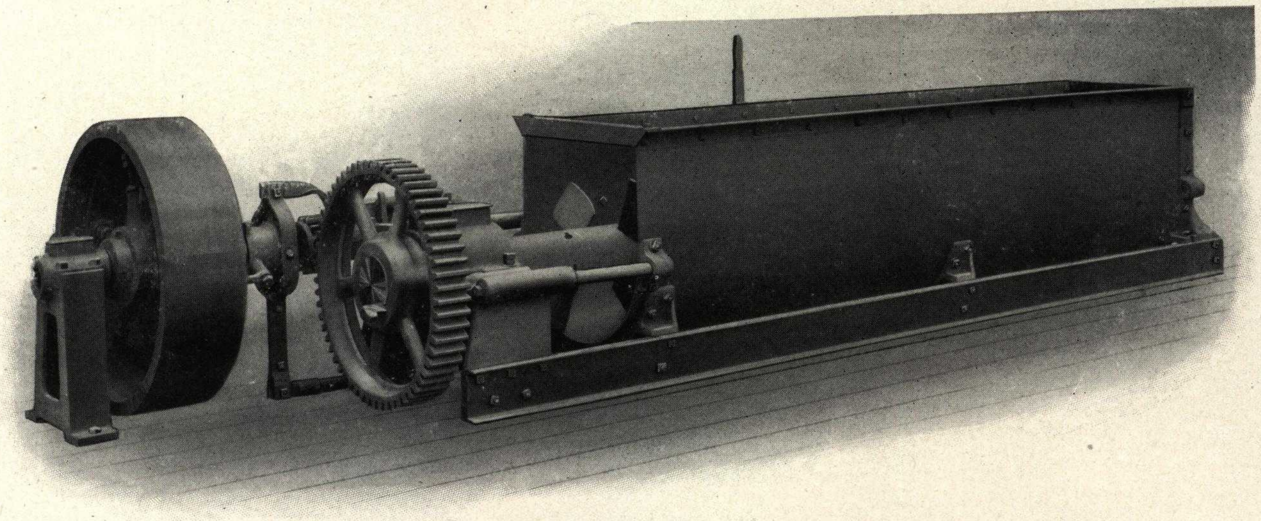
KNIVES—Forged steel, 40 in number.

DRIVING PULLEY—Friction clutch, 34 in. diameter, 10 in. face.

SPEED OF DRIVING SHAFT—150 to 200 revolutions per minute.

DIRECTION OF REVOLUTION—Over from right to left as observer faces clutch.

CAPACITY—Material for 4,000 to 5,000 bricks per hour.



No. 35 Pug Mill (Pulling)

No. 34 (Pushing) and No. 35 (Pulling) Pug Mills

THE knives used in these mills are forged from a steel sufficiently high in carbon to enable them to be hardened, and the manner in which they are attached to the shaft (described elsewhere) permits more of them to be placed on a shaft of a given length than is possible with cast knives. Also the forged knives have a much greater cutting effect upon the clay than the blunt cast knives, and they cut to pieces lumps which would be merely pushed ahead with a cast knife. All this is owing to the fact that the cast knife must be thicker to have the same strength, and because the cast knife very quickly becomes blunt edged on account of its thickness.

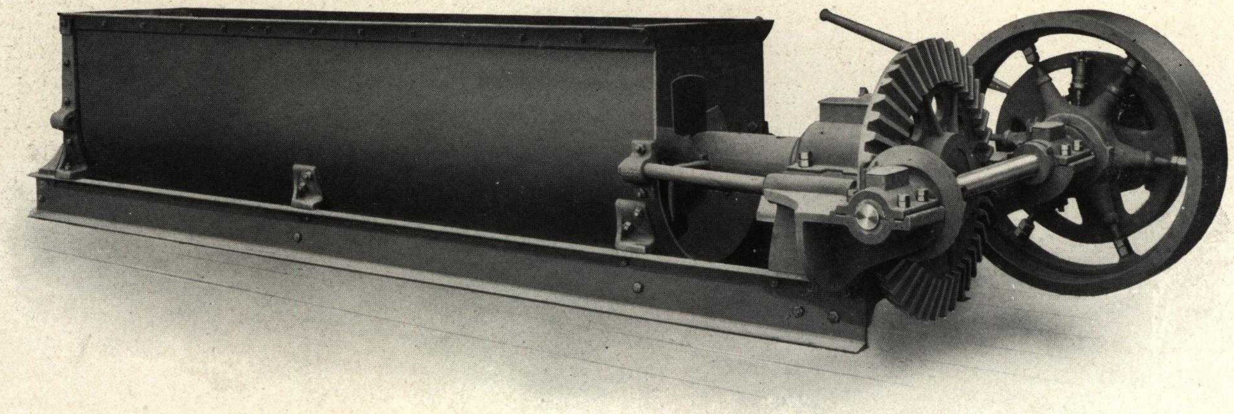
Another feature worthy of especial notice in connection with these pug-mills is that they do not deliver the clay in irregular shaped wads or chunks which are difficult to handle and which easily choke the hoppers and chutes of other machines. On the contrary they deliver the material in a loose, granular form, easily handled yet well mixed and tempered.

Much more convincing argument in favor of this method of building pug-mills is the fact that after a person has used one of them he will be satisfied with no other.

Additional points of information relative to this subject may be found on page 33.

Specifications

WEIGHT—5,400 pounds.
LENGTH—Over all, 16 feet.
WIDTH—Over all, 4 ft. 2 in.
HEIGHT—Over all, 35 inches.
SHAFTS—Pugging, semi-steel, 7½ in. diameter. Driving, steel, 2½ in. diameter.
GEARS—4½ in. face, 1½ in. pitch, ratio 4½ to 1, semi-steel.
JOURNALS—8 to 12 in. long.
SHELL—10 ft. long, 24 in. diameter, 29 in. deep.
OUTBOARD BEARING—Floor stand.
KNIVES—Forged steel, 40 in number.
DRIVING PULLEY—Friction clutch, 34 in. diameter, 10 in. face.
SPEED OF DRIVING SHAFT—150 to 200 revolutions per minute.
DIRECTION OF REVOLUTION—Over from right to left as observer faces clutch.
CAPACITY—Material for 4,000 to 5,000 bricks per hour.



No. 7 Pug Mill (Pulling)

No. 74 and No. 75 Pug Mills

THESE two mills are the same as the No. 34 and No. 35 patterns illustrated and described elsewhere, except that they are bevel instead of spur geared. The No. 75, shown above, is the Pulling pattern, with the discharge end next to the gear frame, and the No. 74, which is not shown, is the Pushing pattern, with the discharge at the end opposite the gear frame, as illustrated by the cut of the No. 34. The construction of these bevel-geared patterns does not differ in any way whatever from that of the spur-geared machines, except in the method of gearing, and the specifications are practically the same.

By locating the bevel pinion on one side or the other of the gear the machine may be driven in either direction regardless of the direction of motion of the belt, and by reversing the driving shaft in its bearings the machine may be driven from either side.

These bevel-geared patterns are not considered standard, are not carried in stock, but are built to order when desired.

Specifications

WEIGHT—5,400 pounds.

LENGTH—Over all, 15 feet.

WIDTH—Over all, 7 ft. 2 in.

HEIGHT—Over all, 2 ft. 11 in.

SHAFTS—Pugging, 7½ in. diameter, semi-steel. Driving, 2½ in. diameter, steel.

GEARS—5 in. face, 2¼ in. pitch. Ratio 3 to 1, semi-steel.

JOURNALS—8 and 12 in. long.

SHELL—10 ft. long, 24 in. diameter, 29 in. deep.

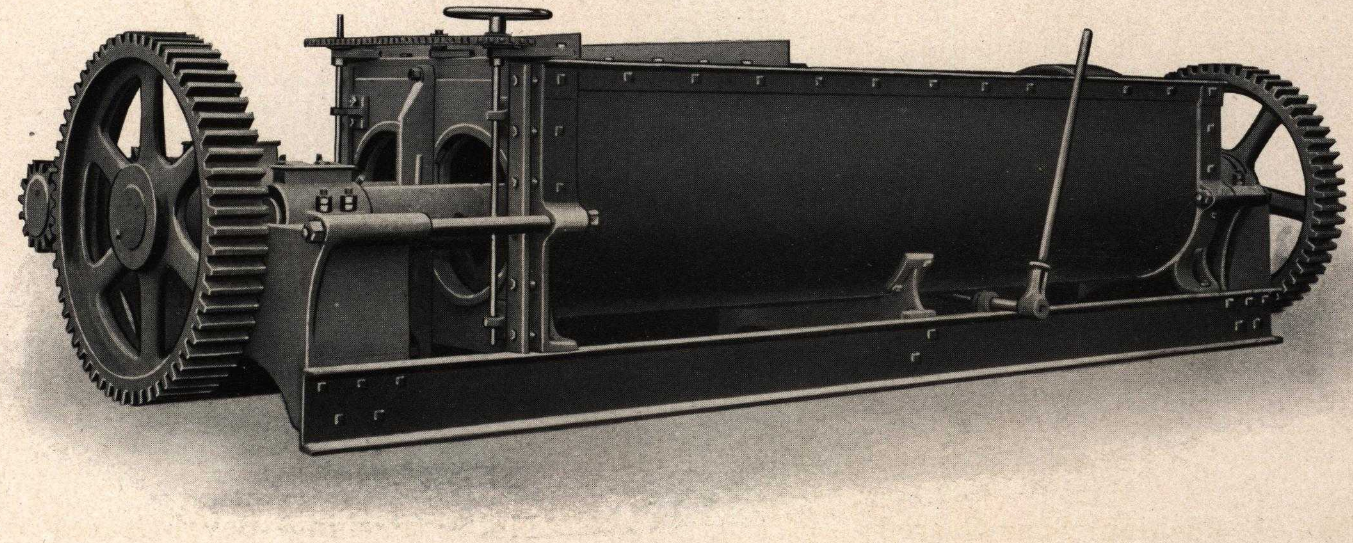
OUTBOARD BEARING—Pillow Block.

KNIVES—Forged steel, 40 in number.

DRIVING PULLEY—Friction clutch. Type B, 34 in. diameter, 10 in. face.

SPEED—150 to 200 revolutions per minute.

CAPACITY—Material for 4,000 to 5,000 bricks per hour.



No. 81 Double Shaft Pug Mill

IN a pug mill with a longer tub than 12 ft. there has always been serious difficulty with the pugging shaft, which on account of the great distance between supports, more easily yields to the stresses necessarily present in a machine doing the amount of work which may be expected of it. To overcome such difficulties, therefore, the double shaft machine offers the means, inasmuch as the length of the shaft need not go beyond the limit of perfect safety.

The objection to large double shaft machines in the past has been the small size of the gears connecting the two shafts, but in this model that point of disadvantage has been entirely eliminated by driving one shaft from each end, thus preserving the ratio of gearing which would be ordinarily used without decreasing the diameter of the gears.

The construction of this machine follows closely the lines of Brewer Pug Mills and Granulators. The knives are forged from hard, high-carbon steel, are mortised into the shaft and held in position by taper keys. Each knife is independently adjustable for pitch and when worn can be set out from the shaft to an extent which greatly prolongs its life. The thrust bearings are of the grooved, marine pattern which gives large friction-surface and prevents the entrance of dust and grit. The gear frames are cast in one piece and all parts are substantial and heavy.

Specifications

WEIGHT—12,800 pounds.

LENGTH—Over all, 18 ft. 1¾ in.

WIDTH—Over all, 6 ft. 9 in.

HEIGHT—Over all, 3 ft. 7 in.

SHAFTS—Pugging, 7 in. diameter, semi-steel.
Driving, 4 in. diameter, steel.

GEARS—6 in. face, 2 in. pitch, ratio 4 to 1.

JOURNALS—10 in. long.

SHELL—10 ft. long, 2 ft. 5 in. deep.

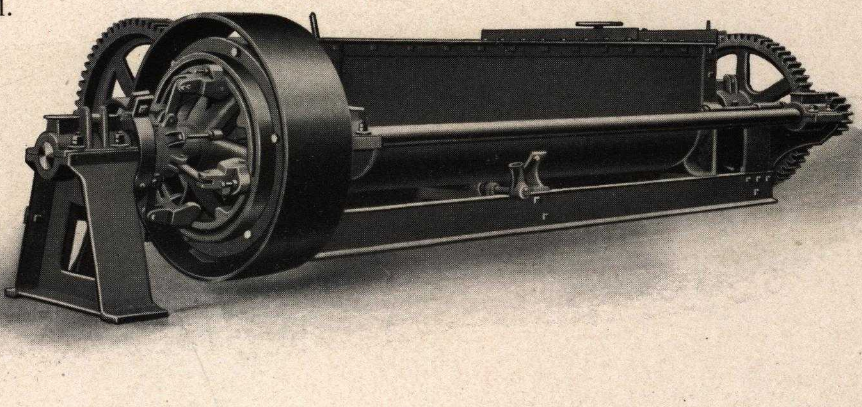
OUTBOARD BEARING—Floor stand.

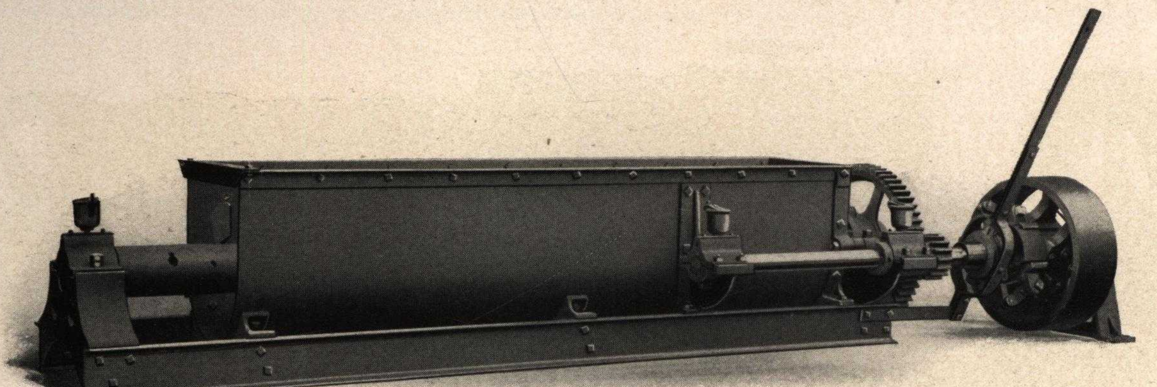
KNIVES—Forged steel, 80 in number.

DRIVING PULLEY — Friction clutch, type F, 29 in., 42 in., diameter, 12 in. face.

SPEED OF DRIVING SHAFT—150 to 200 revolutions per minute.

DIRECTION OF REVOLUTION—Top of pulley runs from the machine.





Pug Mills

No. 91 (Pushing) Spur-Geared
No. 92 (Pulling) Spur-Geared

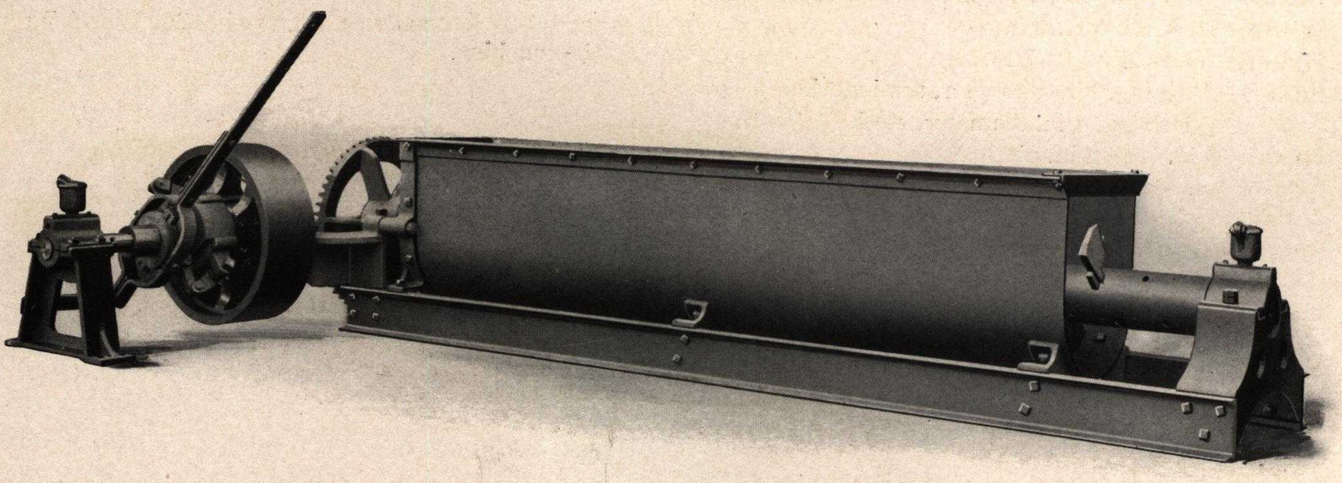
No. 93 (Pushing) Bevel-Geared
No. 94 (Pulling) Bevel-Geared

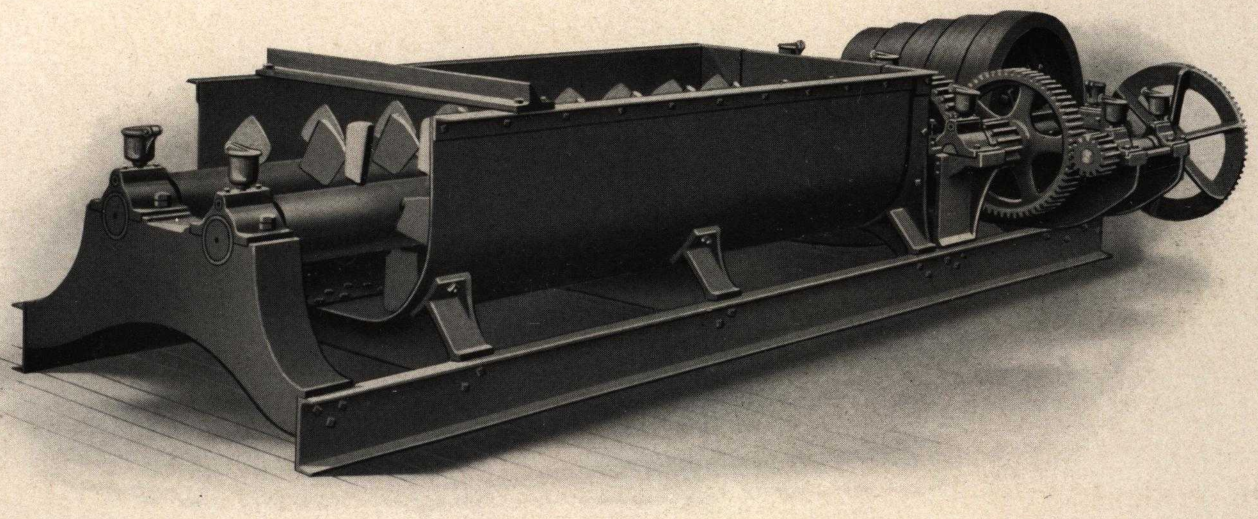
Specifications No. 91 and No. 92

Weight—3,050 pounds.
Length—Over all, 13 ft. 1 in.
Width—Over all, 3 ft. 3½ in.
Height—Over all, 2 ft. 2 in.
Shafts—Pugging, 6 in. diameter, semi-steel. Driving, 2½ in. diameter, steel.
Gears—Semi-steel, 3½ in., face, 1¼ in. pitch, ratio 4 to 1.
Journals—7 in. long.
Shell—8 ft. long, 22 in. deep, ¼ in. steel.
Outboard Bearing—Floor stand.
Knives—Forged steel, 38 in number.
Driving Pulley—Friction clutch, type G, 24 in. diameter, 8 in. face.
Direction of Revolution—Over from left to right as observer faces outlet.
Capacity—3,500 brick per hour.
Speed - 125 to 150 r.p.m.

Specifications No. 93 and No. 94

Weight—3,050 pounds.
Length—Over all, 11 ft. 7¾ in.
Width—Over all 6 ft. 1½ in.
Height—Over all, 2 ft. 2 in.
Shafts—Pugging, 6 in. diameter, semi-steel. Driving, 2½ in. diameter, steel.
Gears—Semi-steel, 3½ in. face, 1⅜ in. pitch, ratio 4 to 1.
Journals—7 in. long.
Shell—8 ft. long, 22 in. deep, ¼ in. steel.
Outboard Bearing—Floor stand.
Knives—Forged steel, 38 in number.
Driving Pulley—Friction clutch, type G, 24 in diameter, 8 in. face.
Direction of Revolution—By changing position of pinion can be driven in either direction.
Capacity—3,500 brick per hour.
Speed - 125 to 150 r.p.m.





No. 90 Combined Granulator-Feeder

Combined Granulator-Feeders

No. 89, Bevel Geared, Pulling
No. 90, Bevel Geared, Pushing

No. 96, Spur Geared, Pulling
No. 97, Spur Geared, Pushing

THIS machine is a combination of a Granulator, a Pug Mill and a Feeder; occupying less space, costing less money and effecting the same results as those three machines installed separately in all cases where conditions are within the range which it is designed to cover.

Its position in the plant is intended to be such that the clay may be dumped directly into a large hopper or bin built over it. The hopper may be of any reasonable size or shape, eight feet or less in depth and of a capacity up to thirty cubic yards.

As a Granulator it will accomplish all that is expected of such a machine, for it has weight and strength enough to stand up under the severe service generally present in those cases. As a Pug Mill it is equal to any 16-ft. single shaft machine as far as mixing and pugging are concerned; and although it cannot, when deeply covered with clay, afford the opportunity for tempering which is present in an open top Pug Mill, it does permit the addition of water to the clay before or after dumping the car, without danger of clogging or bridging in the hopper or bin above it. As a Feeder it has great advantages in control, not only in speed by means of the step-cone pulley which drives it, but from the independent adjustability of the knives, which permits the pitch of a few front knives to be altered so that the rate of discharge may be roughly established within the range of the different speeds to be attained by shifting the belt. In this way the exact rate of discharge for any particular kind or size of ware is obtained and the material put in excellent condition.

The amount of power required to effect these combined results is much less than would be expected, and while it is impossible to make a definite horse-power rating which would apply to all cases, numerous actual tests show results which warrant the establishment of a range from four to eight horse-power.

For convenience in setting, this machine is furnished in four different patterns, No. 89, Bevel Geared Pulling; No. 90, Bevel Geared Pushing; No. 96, Spur Geared Pulling; No. 97, Spur Geared Pushing. The difference between the Pushing and the Pulling patterns is only in the location of the discharging point in reference to the driving pulley. In the No. 89 and No. 96 the clay is discharged between the end of the tub and the gear frame as shown upon catalog pages 31, 33, 35 and 36, while in the No. 90 and No. 97 the discharge is at the end opposite the gear frame as shown in the illustration above.

The construction is high grade throughout. The knives (70 in number,) are forged from hard, high carbon steel. The gears are of cast steel. The thrust bearings are of the grooved marine pattern. The shell is rolled up from ¼-inch steel plate. The bearings are self-oiling. The mounting is upon steel channels self-contained.

See complete specifications and additional illustrations next page.

Specifications No. 89 and No. 90

Weight—9,000 pounds.

Length—Over all, 15 ft. 7 in.
Of tub, 8 ft.

Width—Over all, 76¾ in.

Height—Over all, 38 in.
To top of tub, 32 in.

Shafts—Granulating shafts, 7 in. diameter.
Other shafts, 2 to 2$\frac{15}{16}$ in. diameter.

Gears—Cast steel, 1 to 1½ in. pitch, 3½ to 7 in. face.

Journals—Self oiling, 4 to 9 in. long.

Shell—8 ft. long, 40 in. wide, 23 in. deep, ¼ in. thick.

Knives—Forged steel, 70 in number.

Driving Pulley—Step-cone, 5 steps, 26 to 36 in. diameter, 6½ in. face, with friction clutch Type "G."

Countershaft—Complete with step-cone pulley, driving pulley and hangers furnished complete with machine.

Speed of Countershaft — 250 revolutions per minute.

Specifications No. 96 and No. 97

Weight—9,000 pounds.

Length—Over all, 17 ft.
Of tub, 8 ft.

Width—Over all, 78 in.

Height—Over all, 45 in.
To top of tub, 32 in.

Shafts—Granulating shafts, 7 in. diameter.
Other shafts, 2 to 2½ in. diameter.

Gears—Cast steel, 1 to 1½ in. pitch. 3½ to 7 in. face.

Journals—Self oiling, 4 to 9 in. long.

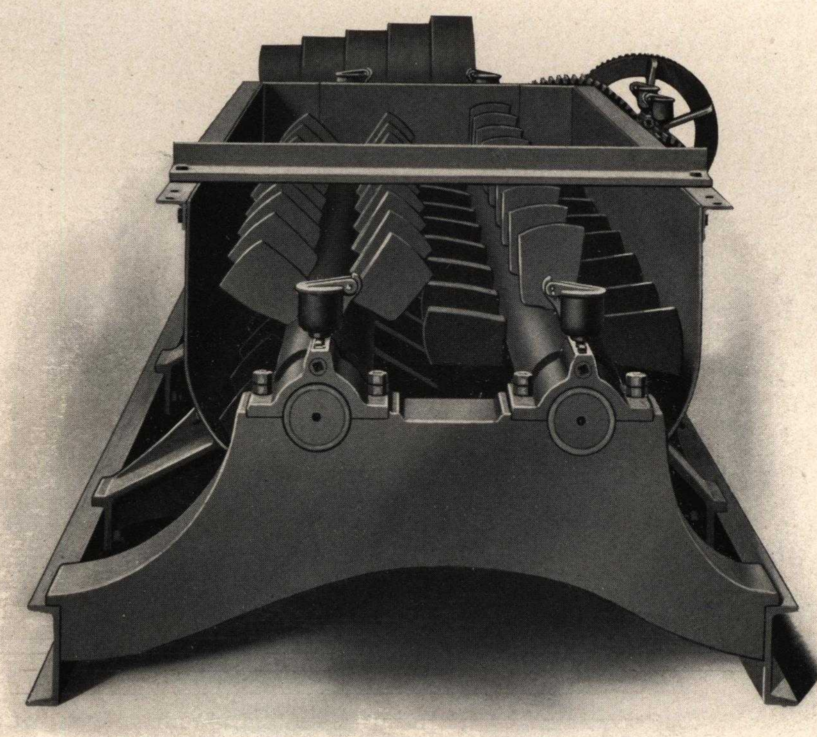
Shell—8 ft. long, 40 in. wide, 23 in. deep, ¼ in. thick

Knives—Forged steel, 70 in number.

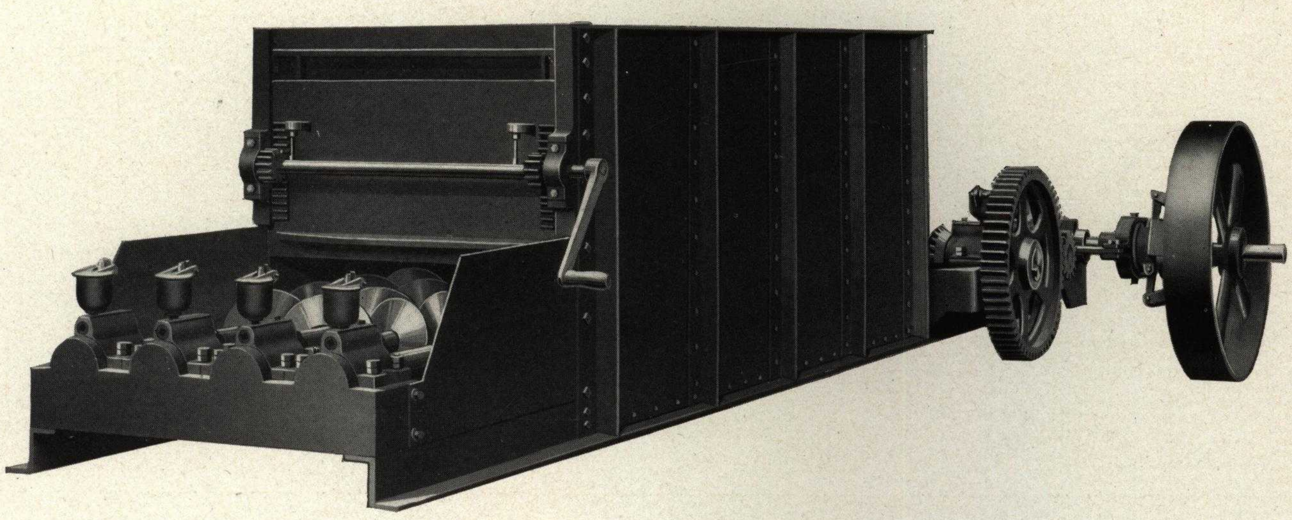
Driving Pulley—Step-cone, 5 steps, 26 to 36 in. diameter, 6½ in. face, with friction clutch Type "G."

Countershaft—Complete with step-cone pulley, driving pulley and hangers furnished complete with machine.

Speed of Countershaft — 250 revolutions per minute.



Nos. 89, 90, 96 and 97 Combined Granulator-Feeders
Showing Arrangement of the Knives



No. 123 Spiral Feeder.

The principal purpose of this machine is to provide a receptacle into which a carload or cartload of clay may be dumped, and from which a uniform discharge at any desired rate may be secured. In addition to these results, however, considerable pugging and mixing effect is obtained; and finally, but most important, is the fact that the expense and dissatisfaction connected with hand or shovel feeding are entirely done away with.

The rate of discharge is regulated by means of the adjustable gate, and it can be effected so closely that there is practically no variation in the output of the plant. The power required to drive is so little that it is not noticed even in small plants where the engine is already overloaded, for the crusher, disintegrator, or machine are never choked with an oversupply of clay.

Particular attention is directed to the specifications below, especially the weight and the size of the shafts and gears. It is not a light, cheap machine, but heavy, well built and durable, and in keeping with the balance of the Brewer high-grade line.

Upon the following page will be found a number of sketches showing twelve different settings for which the machine can be furnished. Figures 1, 3, 5, 7, and 9 show the Pushing Delivery; that is, the clay is delivered at the end of the machine opposite the gear frame. Figures 2, 4, 6, 8 and 10 show the Pulling Delivery in which the clay is discharged between the gear frame and the tub. So little power is required to drive that cross-belts are not objectionable, but arrangements can be made to accommodate almost any possible position and maintain an open belt if desired. Figure 1 shows the standard machine, which will be furnished unless some other figure is specified.

Specifications.

Weight—5,700 pounds.
Length—Over all, 15 feet 9 inches.
  Of tub or hopper, 7 feet.
Width—Over all, 7 feet 9 inches.
  Of tub or hopper, 37 inches.
Height—Over all, 50½ inches.
  From bottom of skid to top of hopper, 42 inches.
Shafts—2½ inches diameter. Pulley shaft.
  First intermediate, 3 inches diameter.
  Second intermediate, 4 inches diameter.
  Spiral, 3 inches diameter.
Gears—Spur, 3½-inch face, semi-steel.
  Miter, 2½-inch face, cast steel.
Bearings—8 inches long, self-oiling.
Spirals—9 inches diameter.
Pulley—Friction clutch, Type "G," 40 inches diameter, 6-inch face.
Speed—40 to 70 revolutions per minute.

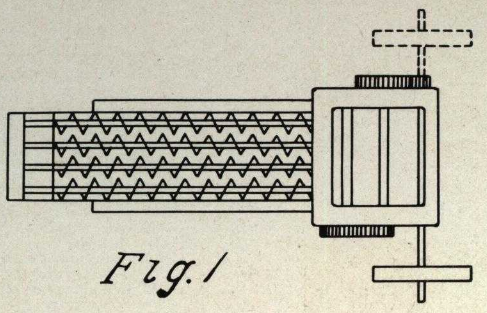


Fig. 1

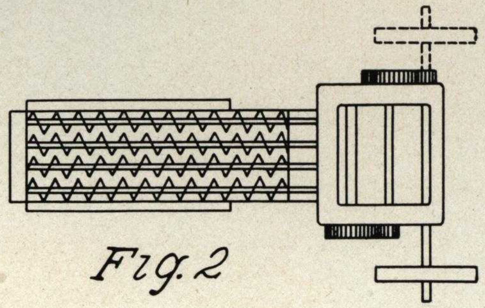


Fig. 2

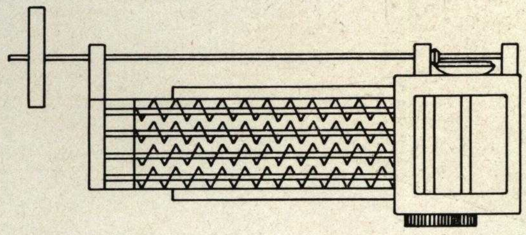


Fig. 3

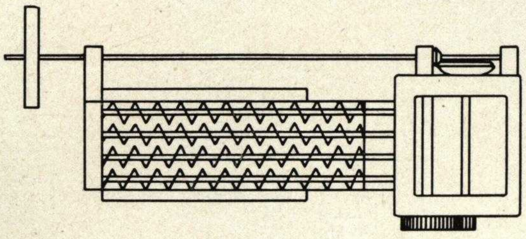


Fig 4

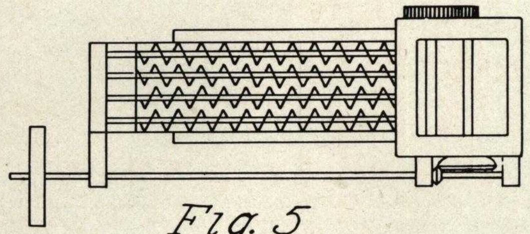


Fig. 5

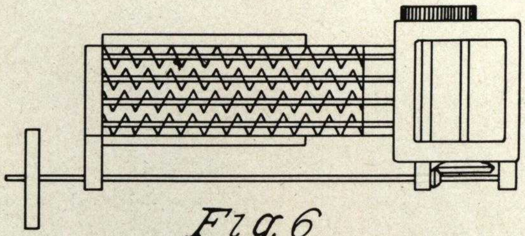


Fig. 6

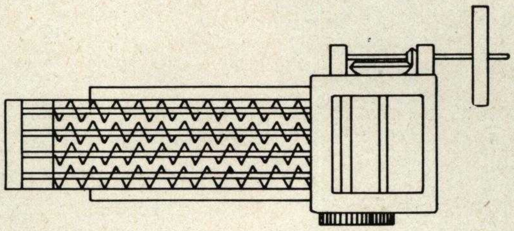


Fig. 7

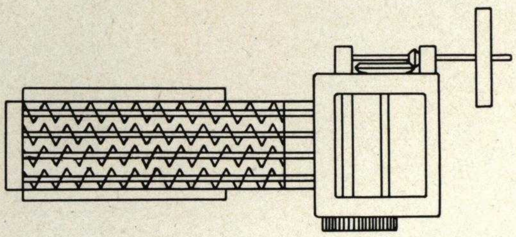


Fig. 8

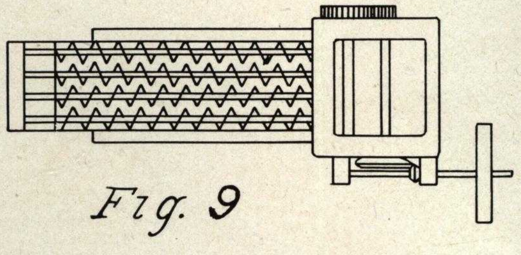


Fig. 9

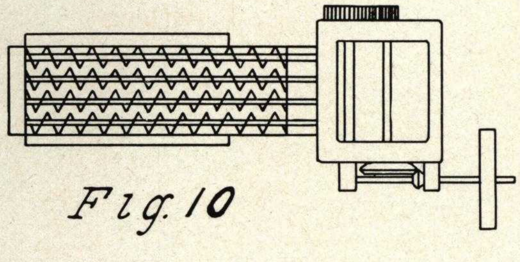
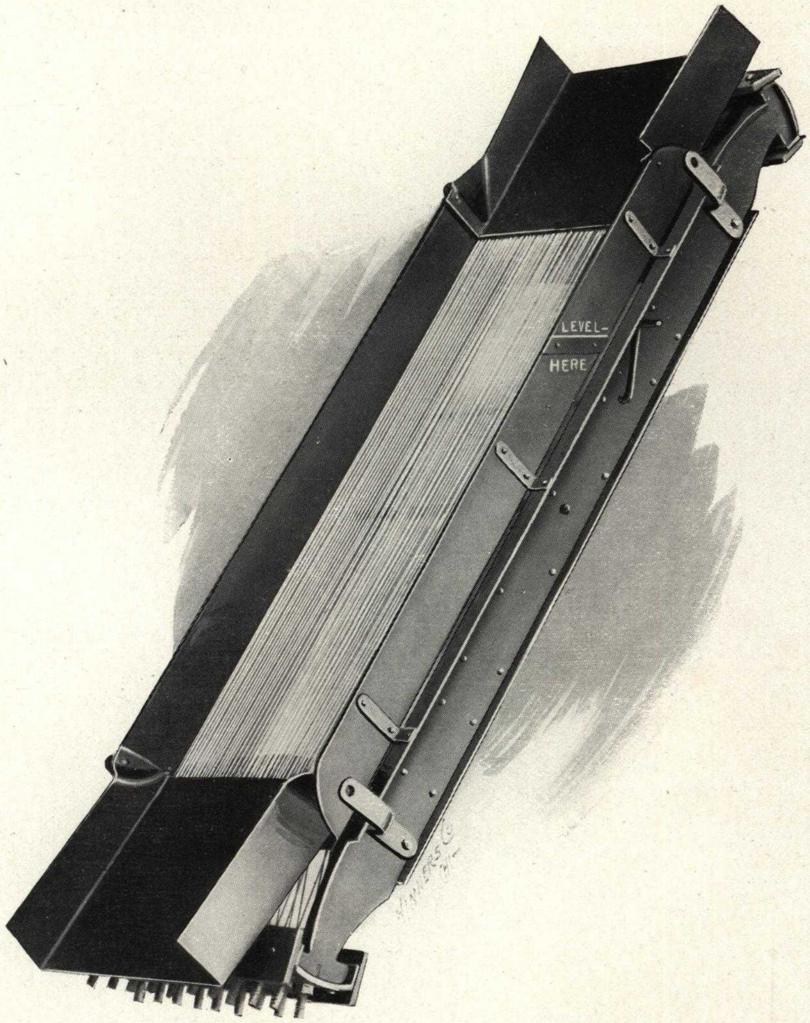


Fig. 10

No. 123 Spiral Feeder.
Plans showing different methods of driving.
H. Brewer & Co.,
Tecumseh Mich.,



Piano Wire Screens

THE simplicity of the Piano Wire Screen, the small amount of room it requires, and the fact that no power and practically no attendance is necessary in its operation, make it a popular device for all ordinary screening purposes. It is undoubtedly the most economical screen to operate, and the absence of moving parts, such as chains, brushes, beaters, and the like, makes it easy to keep in proper condition. It will not clog up or coat over, and will handle any clay which can be put through a dry pan to advantage.

The different sizes specified below are all of the same construction, and differ only in dimensions. The sides are made from heavy steel channels, reinforced; the heads are of cast-iron, and the frame is strung with No. 26 high-grade music wire. Wires may be easily removed, replaced, or tightened, as occasion requires. The distance between wires may be made 3/64 inch or more at the option of the purchaser, but 3/32 inch is considered standard and will be furnished in all cases unless otherwise specified.

In cases where the mesh of the screen has to be changed frequently, once or twice a day, as by fire brick manufacturers, a twin screen is furnished. A pair of screens, one each of the different meshes required, are mounted together on wheels which travel on a track and may be moved to or from the elevator, the clay spouts being stationary.

Specifications

No. 82

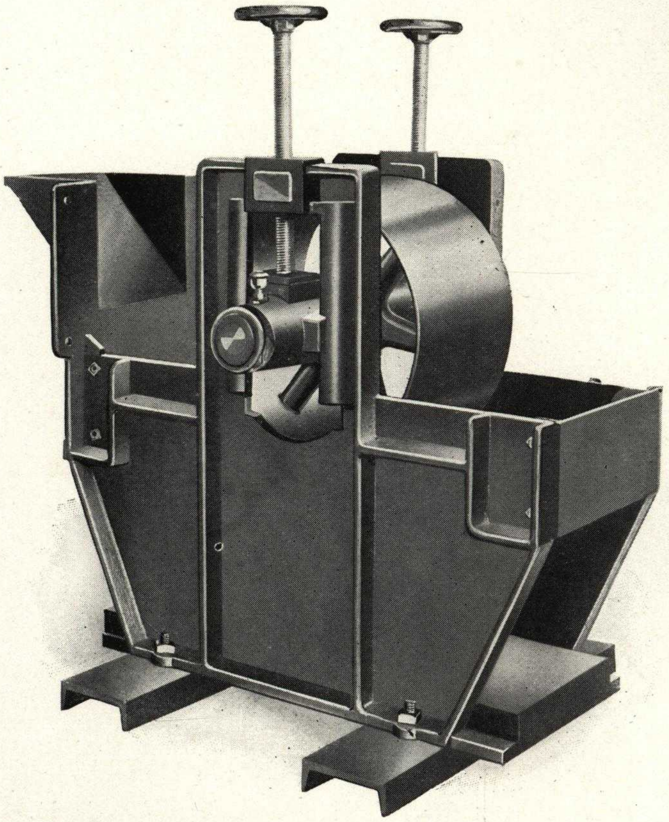
Weight—800 pounds.
Screening Surface—24 in. wide, 60 in. long.
Length—Over all, 8 ft.
Width—Over all, 2 ft., 6 in.
Capacity—Equal to one 9 ft. dry pan.

No. 83

Weight—1,200 pounds.
Screening Surface—36 in. wide, 60 in. long.
Length—Over all, 9 ft.
Width—Over all, 3 ft. 6 in.
Capacity—Equal to two 9-ft. dry pans.

Bucket Elevators

WHILE the Bucket Elevator is an old and well-known device, there are conditions present when clay is to be handled with it for which special provisions must be made, and in these patterns such has been fully accomplished. The boots are of sufficient size to allow ample clearance for the buckets so that clay will not pack upon the inside and to give plenty of room for cleaning out. The front end has a door easily removed when necessary, the rear end is open at all times, and the bottom is easily removed without disturbing anything else. The feeding spout is set at just the proper height and angle, and the side frames are provided with sockets of the proper size to take the 2 x 4 frame of the housing. The bearings of the head are self-oiling, and the driving pulley is of the friction clutch pattern which can be arranged to be operated from considerable distance.



The standard elevator is provided with drums or pulleys in the boot and upon the head, over which is run a stitched canvas belt carrying malleable iron buckets attached upon 16-inch centers, but sprockets and traction wheels may be substituted for the drums and link-belt or sprocket chain for the canvas belt. Pressed steel buckets may be used in place of the malleable, and the distance between centers of buckets may be altered to suit the circumstances or the preference of the buyer.

Price List of Material and Parts

Subject to Discount

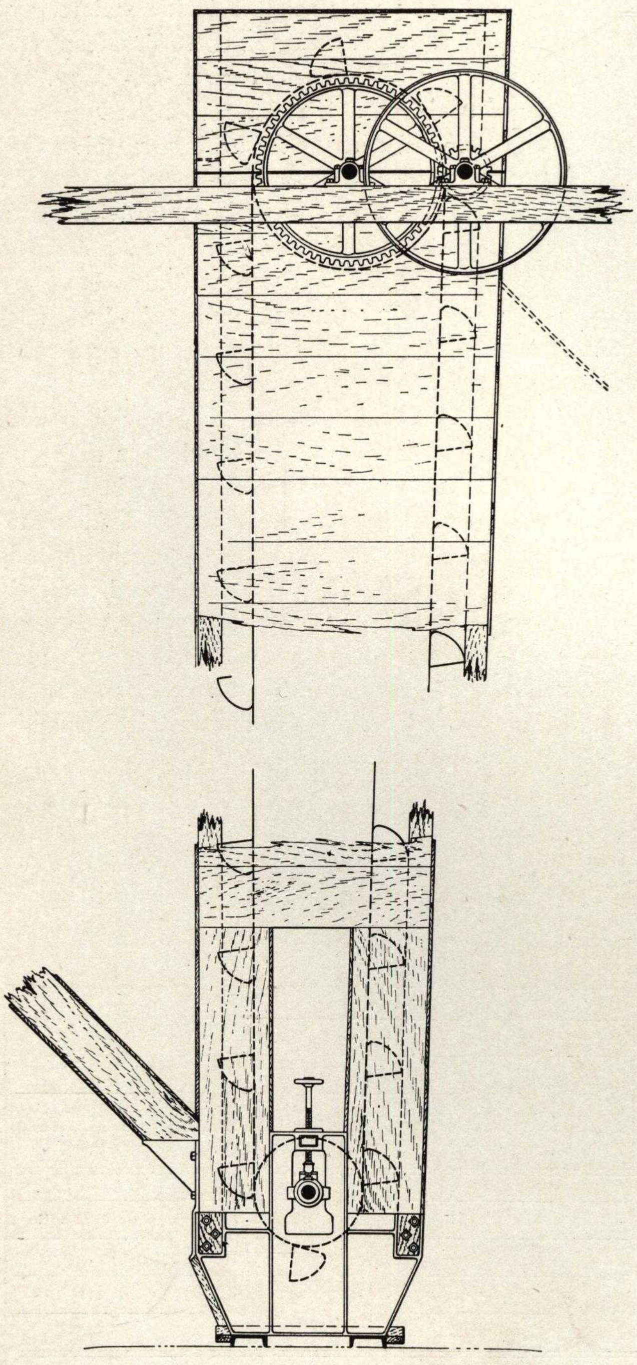
ELEVATOR NO.	BOOTS		HEADS		BELT		
	DIAMETER PULLEY	PRICE	DIAMETER PULLEY	PRICE	WIDTH	PLY	PRICE PER FOOT
84	18 in	37. $~~2~~7.00	30 in.	$40.00	10 in.	6	$1.45
85	18 in.	38. ~~3~~0.00	30 in.	50.00	12 in.	6	1.74
86	18 in	41. ~~3~~6.00	36 in.	65.00	14 in.	6	2.13

ELEVATOR NO.	MALLEABLE IRON BUCKETS WITH ATTACHING BOLTS					
	STYLE	LENGTH	WIDTH	DEPTH	CAPACITY	PRICE EACH
84	A	8 in.	5 in.	4 in.	95 cu. in.	$ .75
85	A	10 in.	6 in.	5 in.	175 cu. in	1.00
86	AA	12 in.	6 in.	5 in.	205 cu. in.	2.20

ELEVATOR NO.	CHAIN WITH NECESSARY ATTACHING LINKS			
	TRADE NO.	LINKS PER 10 FT.	BREAKING STRAIN	PRICE PER FOOT
84	85	30	7600	$ .51
85	95	30	6000	.61
86	1088	46	13700	1.00

See next page for specifications

Bucket Elevators—Continued



Specifications

No. 84

Weight—Head and boot only, 500 lbs.
Buckets—Malleable iron, 8 x 5 inches.
Belt—10 in. x 6 ply stitched canvas.
Gears—2¾ in. face, 1⅛ in. pitch, ratio 4 to 1.
Shafts—2 in. diameter.
Driving Pulley—Friction clutch, Type E, 24 in. diameter, 6 in. face.
Speed—160 revolutions per minute.

No. 85

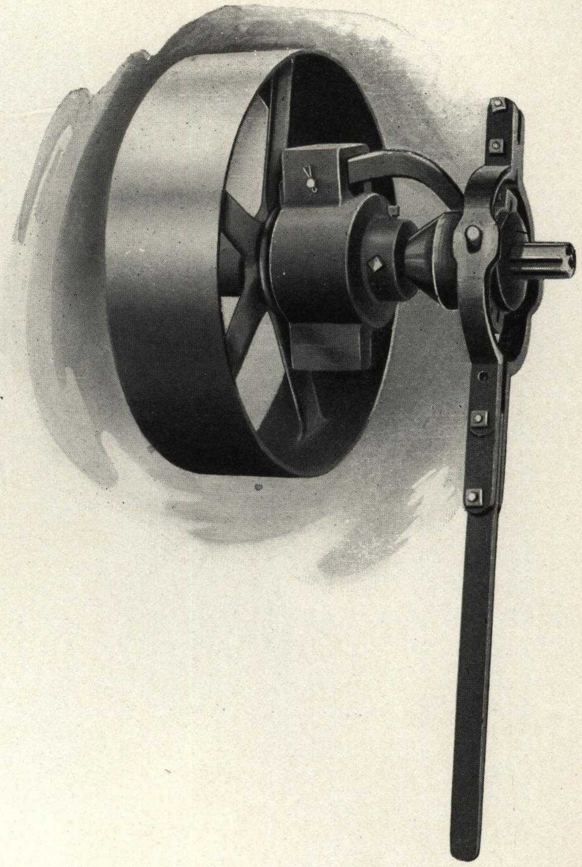
Weight—Head and boot only, 550 lbs.
Buckets—Malleable iron, 10 x 6 inches.
Belt—12 in. x 6 ply, stitched canvas.
Gears—2¾ in. face, 1⅛ in. pitch, ratio 4 to 1.
Shafts—2 in. diameter.
Driving Pulley—Friction clutch, Type E, 24 in. diameter, 6 in. face.
Speed—160 revolutions per minute.

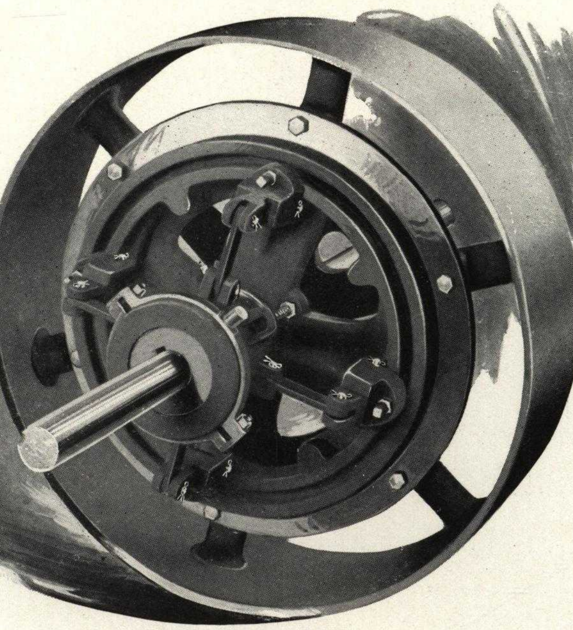
No. 86

Weight—Head and boot only, 800 lbs.
Buckets—Malleable iron, 12 x 6 inches.
Belt—14 in. x 6 ply, stitched canvas.
Gears—4½ in. face, 1½ in. pitch, ratio 4½ to 1.
Shafts—2½ in. diameter.
Driving Pulley—Friction clutch, Type G, 24 in. diameter, 8 in. face.
Speed—125 revolutions per minute.

Type E
Friction Clutch and Pulley

For pulleys 24 inches diameter, 6 inches or less face, and shafts ranging from 1¾ in. to 2¼ in. diameter, the Type E Multiband Clutch and Pulley are considered standard upon all machines shown in this catalog, whether specified otherwise or not. It is a well-built, quick-acting, and durable device, easily capable of transmitting 5 horse-power at 100 revolutions per minute. Space required on shaft, 21 inches.





Type F—Friction Clutch and Pulley

This clutch is of the disc pattern and is built in two sizes, having 20 in. and 29 in. discs respectively. It is heavier and better than any of the previous patterns, and, beginning with the appearance of this page, will be used in place of the Type B and Type C clutches shown in illustrations and mentioned in specifications of the various machines described in this catalog. Generally speaking, the Type F, 20-inch clutch, with pulleys 34 inches diameter and 8 to 12 inches face, will supersede the Type B clutch; and the Type F, 29-inch clutch, with pulleys 45 inches diameter and 10 to 14 inches face, will supersede the Type C clutch. Following are the specifications:

TYPE F. TRIPLE BELT CLUTCHES FOR BREWER SOLID IRON PULLEYS

PULLEY		DIA. CLUTCH DISC.	H. P. AT 100 REV. PER MIN.	BORE	LENGTH KEY-WAY	SPACE ON SHAFT
Dia.	Face					
34 in.	8 in. to 12 in.	20 in.	32	2¼ in. to 3½ in.	11 in.	22½ in.
45 in.	10 in. to 14 in.	29 in.	80	2½ in. to 4 in.	13 in.	25 in.

The pulleys are solid iron, of triple belt weight and latest approved pattern.

Compound Crushers

A General Description of Their Construction

THESE machines consist of a disintegrator or a stone-separator combined with a straight roll crusher for the purpose of fine grinding or of increasing capacity in cases where neither machine alone would give satisfactory results. A straight roll crusher will not readily take large, tough lumps of clay; a conical roll crusher will throw them out; and a disintegrator frequently fails to grind them fine enough; but in a combination of a disintegrator and a crusher the former does the coarse grinding and separating, while the latter, with its rolls close together, does the finishing.

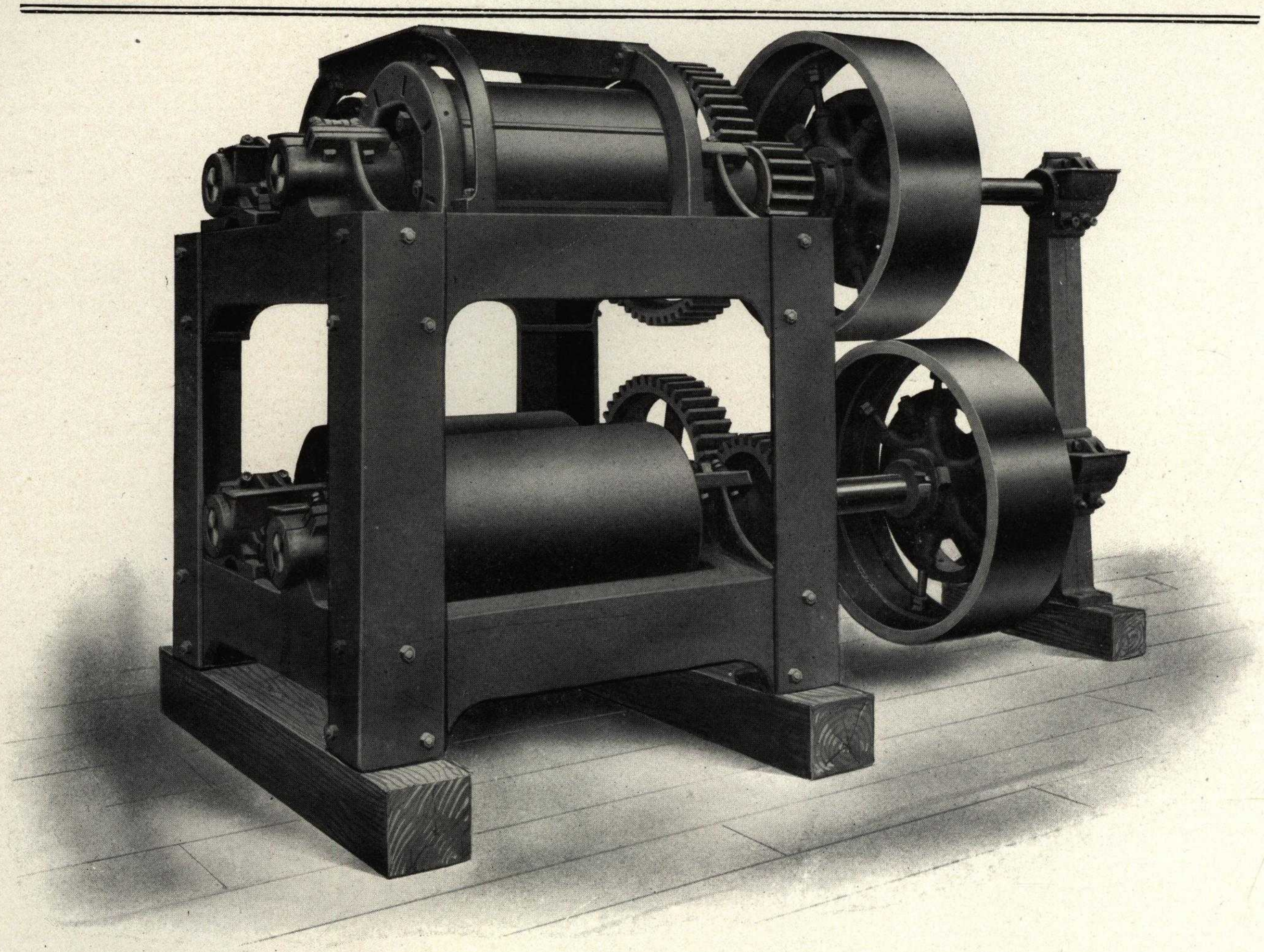
To avoid choking or clogging between the machines, the lower rolls are made of wider face and corresponding greater capacity, and ample open space is allowed so that should a choke occur, it may be easily removed. It is also arranged that any one roll can be removed from the machine without disturbing any other, making it unnecessary to tear down the entire machine to make repairs upon part of it.

The frames are heavy one-piece castings of the same outside dimensions, supported one above the other by upright steel angles, and on account of this construction it is possible to install either machine alone to be followed by the other, to separate the machines and operate them independently, or to abandon one of them at any time if circumstances should warrant.

Being machines for reducing those clays which require fine grinding but which are too damp to handle with a dry-pan and screen, they are generally called upon to work under a variety of severe conditions. The construction, therefore, is most rigid and safe. The journals are machined to the frame, and the crushing stress taken by draw-bolts which under extreme conditions will yield before the safety of the frames would be jeopardized. If desired, springs may be placed behind the rolls at a slight advance in cost, but if fine grinding is to be maintained, the springs can not be recommended.

The ratio of speeds of the lower straight rolls is varied to suit the conditions. For clays which are quite moist, a higher differential is used than for harder or dryer materials, when very nearly the same speed is employed. The greater the difference in the speed of the rolls, the greater the wear upon the faster one, and therefore the higher speed is avoided except in cases where the nature of the material demands it.

See pages 40, 42, and 43 for further information relative to Compound Crushers and Crushing Rolls.



No. 11 Compound Crusher

IN this machine the upper set of rolls is made up of one plain feed roll 20 in. diameter, 24 in. face, driven at 90 revolutions per minute, and either one disintegrating roll or one spirally beaded roll, depending upon the character of the clay to be ground. The disintegrating roll is 20 in. diameter, 24 in. face, is driven at the rate of 300 revolutions per minute, and is supplied with eight lateral, adjustable and removable steel cutting bars. The beaded roll is also 20 in. diameter, 24 in. face, driven at 300 revolutions per minute, and has running spirally around its outside surface a broken series of elevations or projections about 1½ in. wide, 5 in. long, and 3/16 in. high. The feed roll is adjustable for fineness of grinding by movement of its journals toward or from its mate by means of draw-rods provided for that purpose, which also take the crushing stress.

The lower pair of rolls are both plain straight face, 20 in. diameter, 30 in. long, and are run either at differential or like speeds as the case may require. One of them is adjustable for fineness of grinding by means of draw-rods passing through the journals in such a manner that they will break and preserve the safety of the balance of the machine should a piece of metal or other similar substance get into it.

A general description of this machine may be found upon page 37, and illustrated matter relative to the construction of the rolls upon page 40.

Specifications

WEIGHT—13,500 pounds.

FLOOR SPACE—4 ft. 8 in. x 9 ft. 5 in.

HEIGHT—Over all, 5 ft. 8 in.

SHAFTS—4 in. diameter, steel.

GEARS—5 in. face, 1¾ in. pitch, semi-steel.

JOURNALS—12 in. long.

OUTBOARD BEARING — Double floor stand for both shafts.

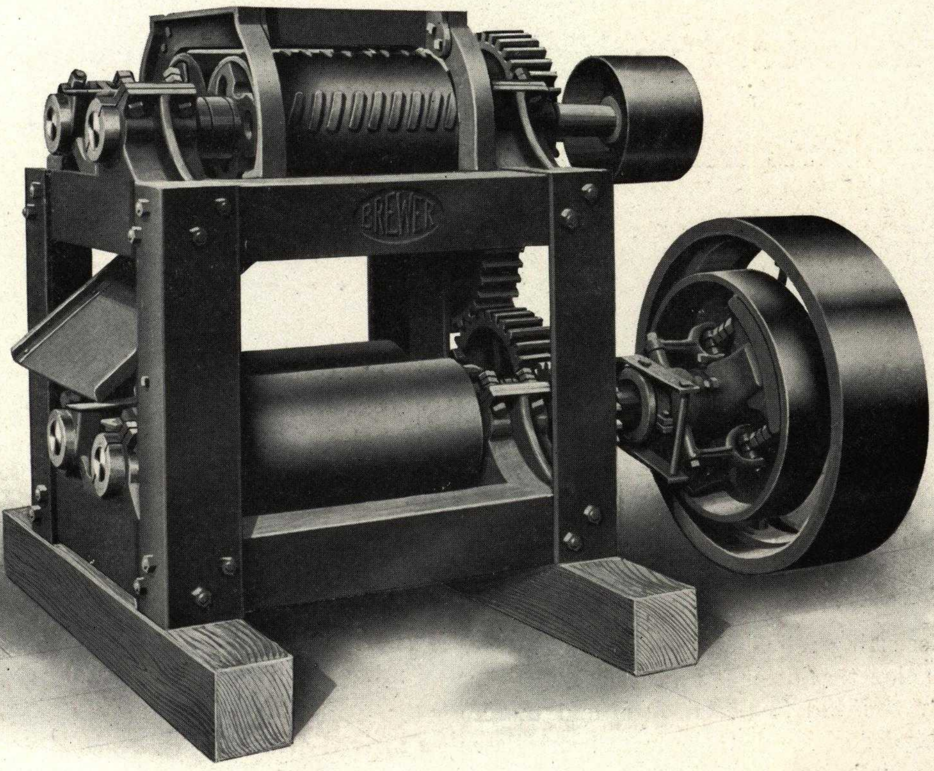
DRIVING PULLEYS—Friction clutch, Type B, 36 in. diameter, 12 in. face.

SPEEDS—Upper pulley, 300 revolutions per minute.

Lower pulley, if rolls are differential speeds, 325 revolutions per minute.

Lower pulley, if rolls are same speed, 175 to 200 revolutions per minute.

CAPACITY—10,000 brick per hour.



No. 71 Compound Crusher

To meet the demand for a Compound Crusher of smaller size than the No. 11 previously described, this No. 71 pattern has been designed along the same lines, with the same care and attention to details. The construction is identical, except where the difference in size makes changes necessary, and is high grade in every respect.

The upper set of rolls is made up of one plain feed roll 12 in. diameter, 18 in. face, running about 150 revolutions per minute, and either one disintegrating roll or one spirally beaded roll, depending upon the character of the clay to be handled. The disintegrating roll is 12 in. diameter, 18 in. face; is run at the rate of 900 revolutions per minute, and is supplied with six lateral, adjustable and removable steel cutting bars. The beaded roll is also 12 in. diameter, 18 in. face, run at the rate of 950 revolutions per minute, and has running spirally around its outside surface a broken series of elevations or projections. The feed roll is adjustable for fineness of grinding by movement of its journals toward or from the disintegrating roll or beaded roll, whichever may be used, by means of draw-rods provided for that purpose, which also take the crushing stress.

The lower rolls are both of the plain, straight face pattern, 12 in. diameter, 22 in. long, and are driven either at differential or the same speeds, according to the character of the material to be ground. One of them is adjustable for fineness of grinding by means of draw-rods passing through the journals in such a manner that they will break before other parts of the machine are in danger when pieces of metal or other similar substances get into it.

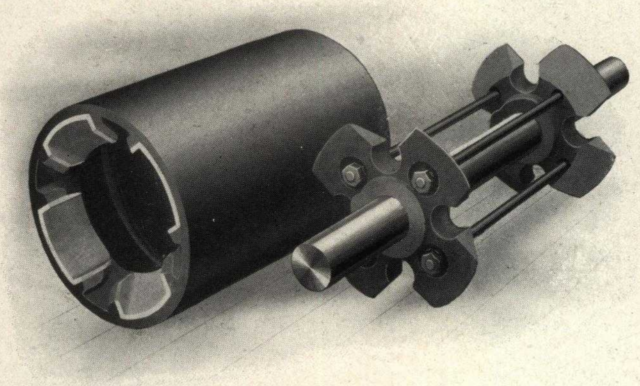
A general description of this machine may be found upon page 41, and upon page 40 the construction of the rolls is illustrated and described.

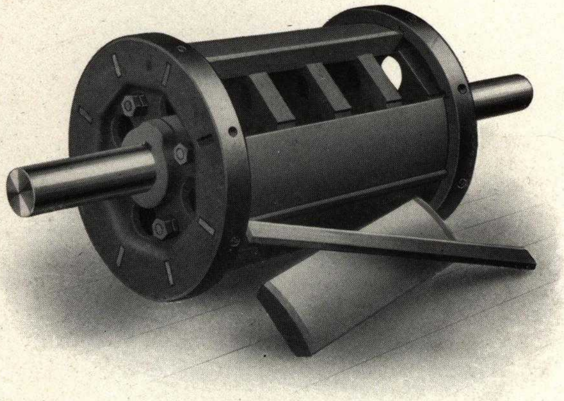
Specifications

Weight—4,625 pounds.
Floor Space—3 ft. 8 in. x 7 ft. 1½ in.
Height—3 ft. 10¼ in.
Shafts—2⅞ in. diameter, steel.
Gears—4½ in. face, 1½ in. pitch, semi-steel.
Journals—9 in. long.
Outboard Bearing—Pillow block.
Driving Pulleys—Friction clutch, Type B, 34 in. diameter, 10 in. face, and Plain 12 in. diameter, 8 in. face.
Speeds—Upper pulley, 900 revolutions per minute.
Lower pulley, if rolls are differential speeds, 300 revolutions per minute.
Lower pulley, if rolls are same speeds, 175 to 200 revolutions per minute.
Capacity—3,500 brick per hour.

Brewer Crushing Rolls with Removable White-Iron Shells

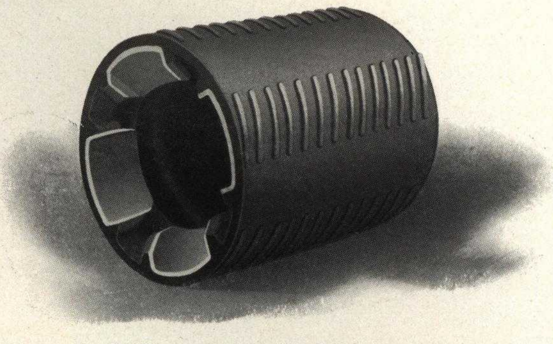
An Illustrated Description of Their Construction



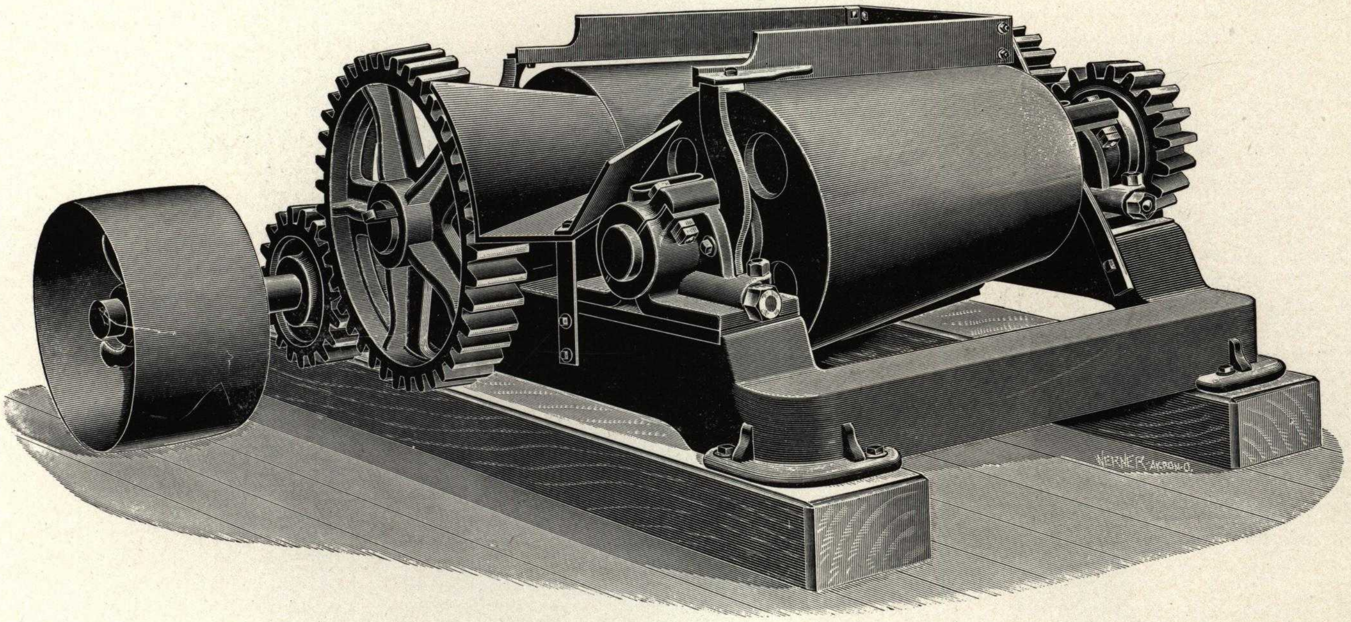


A GOOD crushing roll must not only resist wear to the greatest practicable extent, but must be of such construction that after it has worn it may be put in good condition again at a reasonable cost. The wear is mostly confined to the surface, and therefore the more closely we can separate the surface only from the remainder of the roll, the more nearly have we arrived at a satisfactory condition. To accomplish this end the roll is built up, as shown by the engraving, of a shaft, two heads, a removable shell, and four draw-bolts. The heads are secured to the shaft by means of keys driven from the inside after the shell is located and bolts drawn up. The shells are made of white-iron by a special process developed at considerable expense, and both in hardness and strength excel ordinary white-iron or chilled iron. They are provided with retaining pockets in the ends, and are prepared for use at the factory before shipment by setting up in a jig which properly centers them and babbitting the pockets. This assures perfect interchangeability and alignment. To avoid possibility of slipping between the ends of the shell and the heads, driving lugs are provided which engage the arms of the heads and prevent rotation of one part without corresponding movement of the other. The shells are heavily ribbed on the inside for strength.

Disintegrating rolls with lateral steel cutting bars are also supplied, and while the construction is less simple, the plan of providing for quick, inexpensive, and easy replacing of worn parts is closely followed. The wearing surface of the roll is made up of special white-iron staves, which, together with the tempered tool steel bars, are clamped into position by means of the heads with suitable draw-bolts. The inside surfaces of the heads are recessed to correspond with the tapering shape of the stave-ends, and therefore when clamped together by means of the draw-bolts, hold both staves and bars rigidly in position. The engraving shows the assembled roll with one stave and one bar left out so that the interior construction of the roll and the shape of the stave and bar may be plainly seen.



Several patterns of removable roll shells are supplied for as many purposes or crushing machines, plain straight-face shells for ordinary grinding; beaded rolls, which have a bead or projection running spirally around the exterior surface, for stone separating purposes; and conical shells, used only with conical roll crushers for a like purpose of removing stones which the clay may contain.


WERNER·AKRON·O.

No. 2 Conical Roll Clay Crusher

THE features of this machine are its great strength and its heavy compound gearing. The frame is cast in one piece, and the crushing stress is taken by $1\frac{1}{4}$-inch steel rods which pass through the journals and also serve to adjust the distance between the rolls. The gearing of the standard machine is arranged to drive the rolls at differential speeds, but for special purposes suitable gears can be substituted to drive both rolls at the same speed if desired.

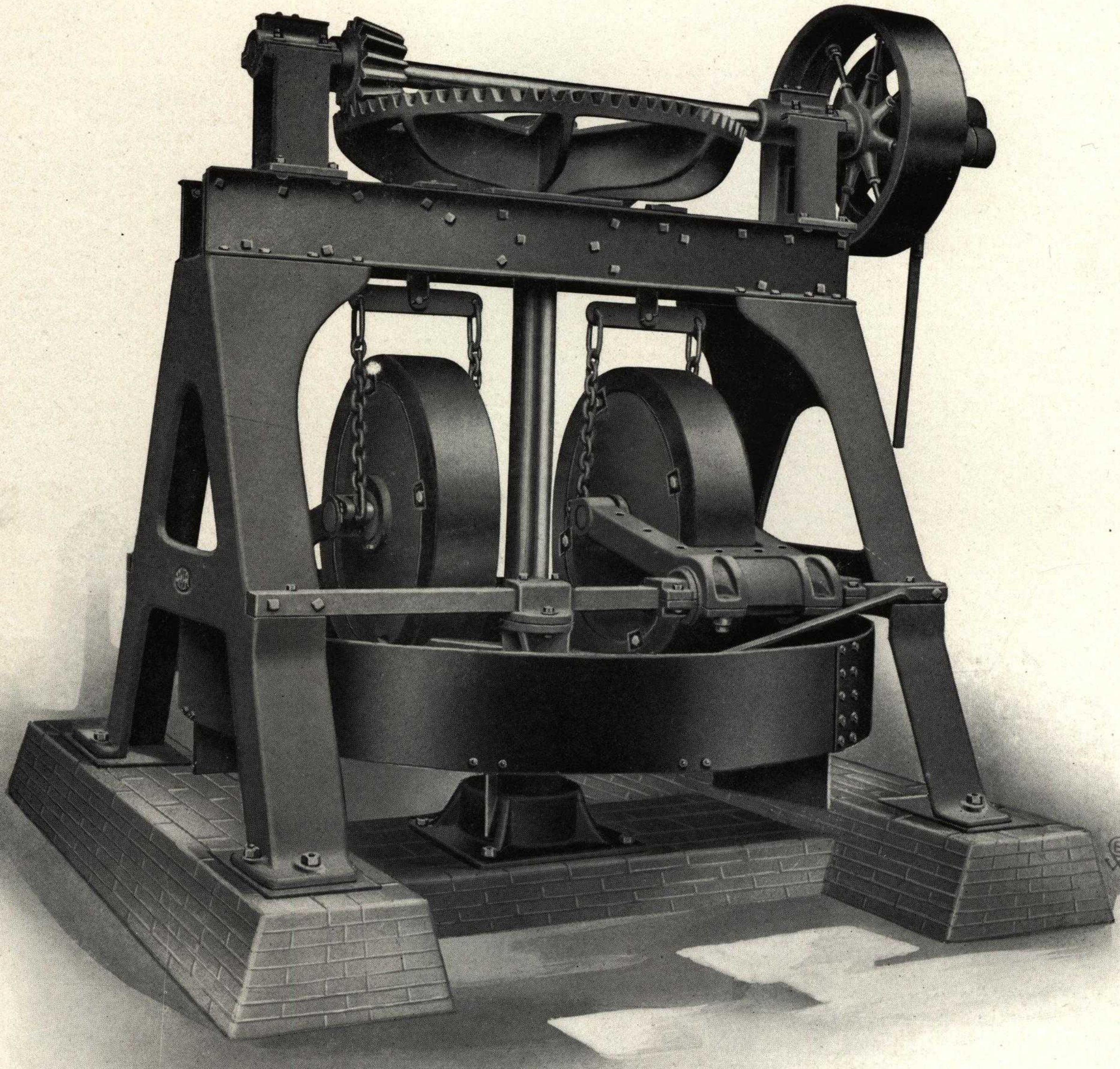
The rolls differ from those shown in the illustration above in that they are of the removable white-iron shell construction shown on page 45. They are 32 inches long, 22 inches diameter at one end, tapering to 18 inches diameter at the other, and are so mounted in the frame that stones which are not readily passed through are carried to the larger end and discharged through the chute.

The inclination of the roll shafts, one to the other, permits the maintenance of the gears at the proper depth in mesh, regardless of how the rolls are set, by moving them in or out upon the shafts. The roll scrapers are cast in one piece, and are adjustable from above. When worn, they may be made as good as new by riveting or bolting steel strips to the working faces.

The illustration above shows a plain driving pulley, but a suitable friction clutch pulley is furnished in all cases as well as an outboard bearing for the driving shaft.

Specifications

Weight—5,885 pounds.
Length—6 feet.
Width—4 feet.
Height—2 ft. 4 in.
Shafts—Driving, 3 in. diameter, steel.
  Roll, 4 in. diameter, steel.
Gears—$4\frac{1}{2}$ in. face, $2\frac{1}{4}$ in. pitch, semi-steel.
Journal Boxes—8 in. and 10 in. long.
Outboard Bearing—Pillow block pattern.
Driving Pulley—Type B, friction clutch, 34 in. diameter, 10 in face.
Speed—200 to 250 revolutions per minute.
Direction of Revolution—Over from right to left as shown in cut.
Capacity—5,000 to 15,000 bricks per hour.



Dry Pans

No. 67 Nine-foot. No. 66 Five-foot

THESE Dry Pans have been designed along entirely modern lines and after a careful study of all other pans now on the market. The intention has been to make them a little better than any of the others, and as may be seen from the description and specifications, there are many features which show that expense has not been spared in the effort.

The Frame consists of heavy cast iron ends, having deep flanges and ribs, joined at the top of two heavy steel channels which form the top beam and support the bearings for driving and pan shafts. The ends are also joined near the bottom by two 3-inch square steel bars which support the mullers and scrapers. The driving shaft bearings are rigid, erected to provide proper alignment and mesh of gears, and no adjustment is required or advised.

The Mullers have heavy detachable white-iron tires and removable bearings. Each one is mounted independently of the other and suspended from the top beam through a heavy spiral spring so that the pan is relieved of violent shock when the mullers pass over hard substances. This method of construction, by means of which the mullers rise and fall in a vertical line, causes the tires to wear evenly across the face, thus increasing the durability of the tires and providing greater grinding capacity.

The Step Bearing which takes the weight of the pan and mullers, is self-oiling and self-adjusting, and the wearing surfaces, which are of large area, are made of materials particularly adapted to the purpose. The bearing is readily accessible, and wearing parts easily removed and renewed at a nominal cost. In the standard method of setting, a suitable foundation is to be provided for this bearing, but when it is desired to construct a bin beneath the pan, a hanger will be furnished, by means of which it may be suspended from two I-beams placed across the top of the side foundations.

The Wearing Plates are made of white-iron, and are easily renewed when worn. They are of deep cross-section, and, being of the same hardness throughout as a chilled plate is on the surface, will give much more wear than similar parts of any other material.

The Screen Plates are made of malleable iron, which allows increased screening surface and at the same time provides ample strength, with long life. They are easily replaced when finally necessary on account of wear.

The Scrapers are made of cast iron, are adjustable for pitch, and have removable and adjustable faces of hard crucible steel.

The Shafts and Gears. All shafts, even to the vertical or pan shaft, are of steel and of liberal size, as shown by specifications. The gears are of the usual BREWER standard, wide face, coarse pitch, and moulded from machine divided and cut patterns.

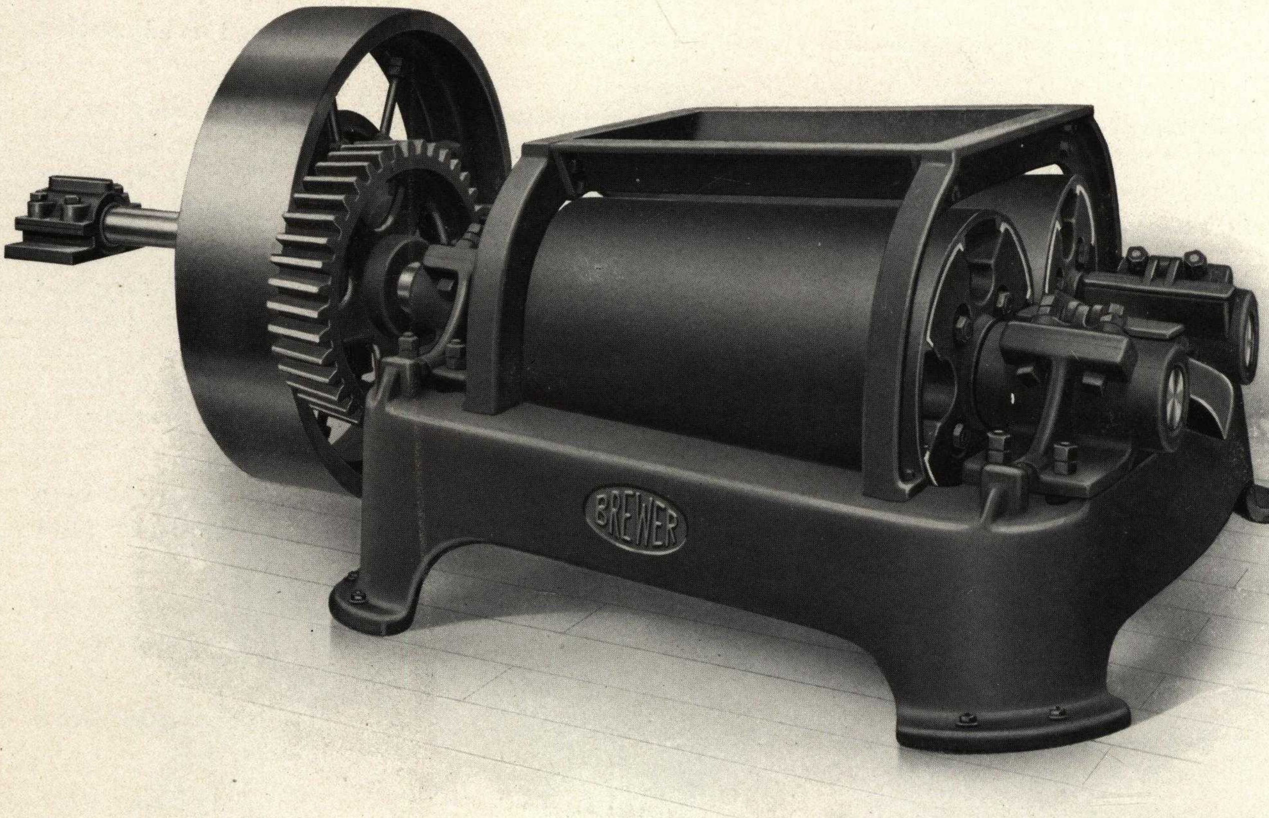
Brick Setting. When desired, the necessary parts to provide for what is known as the Brick Setting will be furnished, together with the necessary plans and specifications for the brickwork. In this method heavy brick walls are substituted for the cast end frames, but the balance of the parts are practically the same as are used in the standard machine.

Specifications, No. 67, Nine-foot Dry Pan

WEIGHT—35,000 pounds.
LENGTH—Over all, 12 ft. 6 in.
WIDTH—Over all, 9 feet.
HEIGHT—Over all, 12 ft. 8 in.
MULLERS—48 in. diameter. Tires, 10 in. face (more or less if desired), 5 in. thick; removable.
GEARS——7½ in. face, 2¾ in. pitch, semi-steel.
SHAFTS—Pan, 7 in. diameter, steel.
  Muller, 4 in. diameter, steel.
  Driving, 4 in. diameter, steel.
DRIVING PULLEY—Friction clutch, Type C, 42 in. diameter, 12 in. face.
SPEED—150 Revolutions per minute.
Pulley may be placed on either side of frame.
Mullers and scrapers may be placed to run pan in either direction.

Specifications, No. 66. Five-foot Dry Pan

WEIGHT—14,000 pounds.
LENGTH—Over all, 96 inches.
WIDTH—Over all, 64 inches.
HEIGHT—Over all, 94 inches.
MULLERS—36 in. diameter. Tires 7 in. face (more or less if desired), 3½ in. thick; removable.
GEARS—5 in. face, 1¾ in. pitch, semi-steel.
SHAFTS—Pan, 4½ in. diameter, steel.
  Mullers, 3 in. diameter, steel.
  Driving, 3 in. diameter, steel.
DRIVING PULLEY—Friction clutch, Type B, 34 in. diameter, 8 in. face.
SPEED—200 revolutions per minute.
Pulley may be placed on either side of frame.
Mullers and scrapers may be placed to run pan in either direction.



No. 21 Conical Roll Clay Crusher

No. 21 and No. 59 Conical Roll Clay Crushers

CONICAL Roll Crushers are used principally for removing or separating from clay the larger stones which it may contain, while the smaller ones are drawn between the rolls and ground fine enough to avoid wire breakage or trouble at the die. They are not intended for finer grinding, nor are they suitable for grinding clays which would be fed to them in very large or exceedingly tough lumps.

These Conical Roll Crushers are built in two sizes, both of which are of the same design and construction throughout. The frames, together with one pair of journals, are one-piece castings, while the second pair of journals are machined to the frame and are adjustable for fineness of grinding. The dividing lines between boxes and caps are inclined from the center to throw the pressure of the shafts into the rigid boxes instead of to the point of division between boxes and caps as would be the case were the journals parted upon a horizontal line. The rolls are driven at differential speeds, which produces a grinding rather than a rolling effect upon the clay, and leaves the ground material in excellent condition for tempering. The gears, being also of conical form, may always be adjusted to the proper depth in mesh irrespective of the distance between the rolls. The scrapers are cast in one piece, are adjustable from above, and when worn may be replaced at a nominal cost or repaired by riveting flat steel strips to sides of the worn part.

The construction of the rolls is a very important feature in connection with these machines, and is described elsewhere in this catalog.

Specifications of the No. 21

WEIGHT—6,000 pounds.

LENGTH—Over all, 5 ft. 4 in.

WIDTH—Over all, 9 ft. 2 in. Of frame, 4 ft. 10 in.

HEIGHT—To top of hopper, 2 ft. 9 in.

ROLLS—32 in. long, tapering from 22 to 18 in. diameter. Removable shells of white iron.

SHAFTS—4 in. diameter, steel.

GEARS—5½ in. face, 1¾ in. pitch, semi-steel.

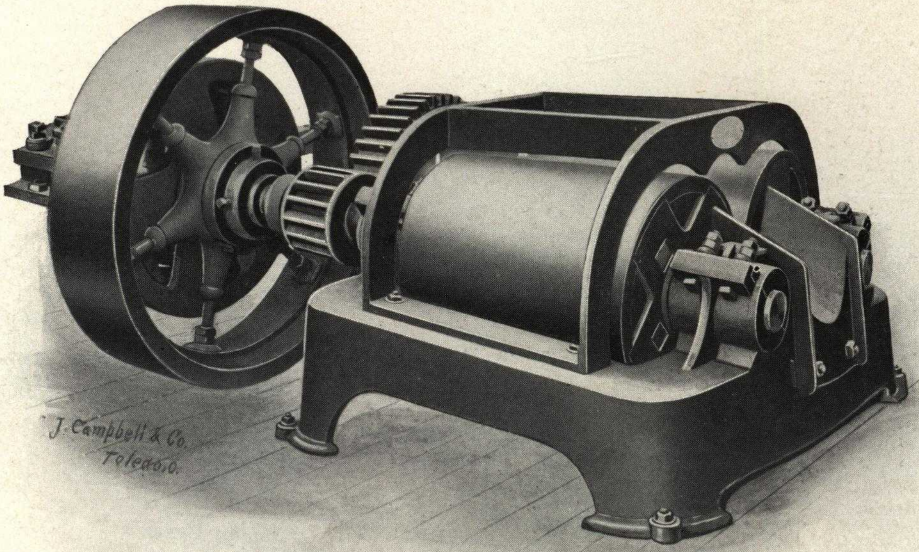
JOURNALS—12 in. long.

OUTBOARD BEARING—Pillow block.

DRIVING PULLEY—Friction clutch, Type B, 42 in. diameter, 10 in. face.

SPEED OF DRIVING SHAFT—250 to 300 revolutions per minute.

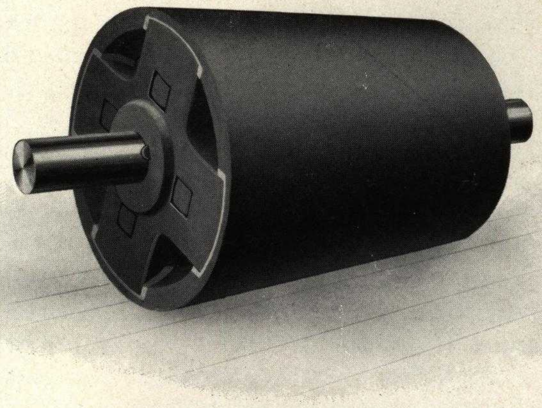
CAPACITY—Material for 5,000 to 10,000 bricks per hour.


J. Campbell & Co. Toledo, O.

No. 59 Conical Roll Clay Crusher

No. 21 and No. 59 Conical Roll Clay Crushers

THE rolls with which these crushers are provided are of the removable shell type, in which the wear is confined to parts made of the hardest practicable material and capable of being replaced when worn, at a comparatively small expense. To the shaft are keyed two spiders or heads, and between these spiders is located the white-iron shell, the several parts being held together with four heavy draw-bolts. The shells are self-centering and interchangeable, the points of contact being babbitted in a jig before leaving the factory.



The white-iron of which these shells are made, is very hard. It is safe to say that a white-iron roll shell will last as long as two chilled rolls of the old pattern, and when finally worn out, nothing but the shell has to be replaced.

The design and construction of these two Conical Roll Crushers, with the exception of points relative to the rolls, is described upon a preceding page, where a number of important details are mentioned.

Specifications of the No. 59

Weight—3,000 pounds.

Length—Over all, 5 feet.

Width—Over all, 6 ft. 10 in. Of frame, 3 ft.. 3½ in.

Height—To top of hopper, 25½ inches.

Rolls—22 in. long, tapering from 17 to 14 in. diameter. Removable shells of white-iron.

Shafts—2⅞ in. diameter, steel.

Gears—4½ in. face, 1½ in. pitch, semi-steel.

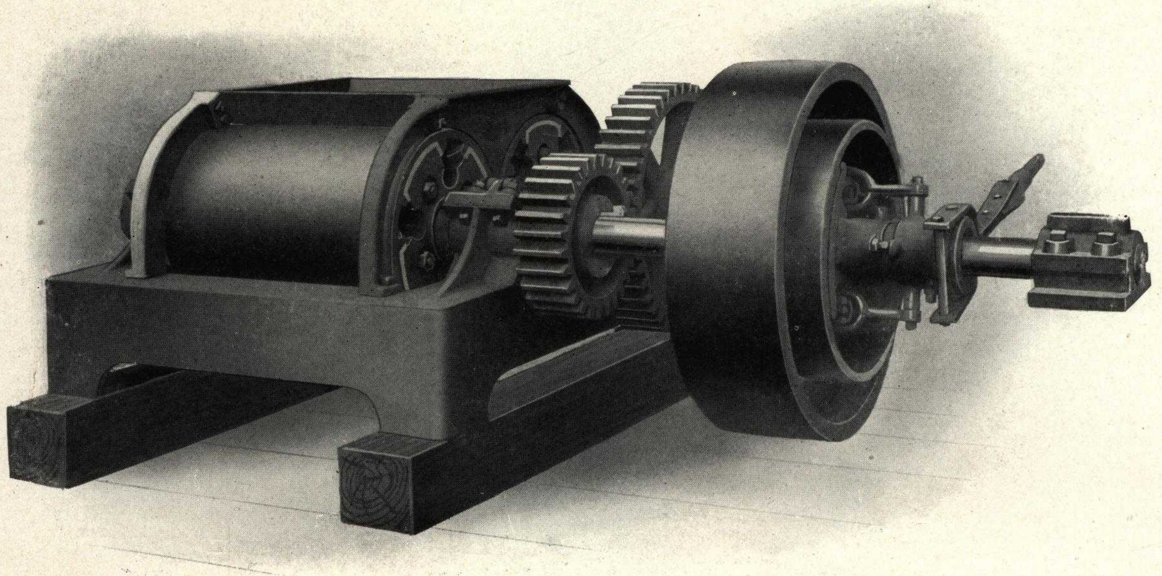
Journals—7 in. long.

Outboard Bearing—Pillow block.

Driving Pulley—Friction clutch, Type B, 34 in. diameter, 10 in. face.

Speed of Driving Shaft—250 to 300 revolutions per minute.

Capacity—Material for 2,500 to 4,500 bricks per hour.



No. 16 Straight Roll Crusher

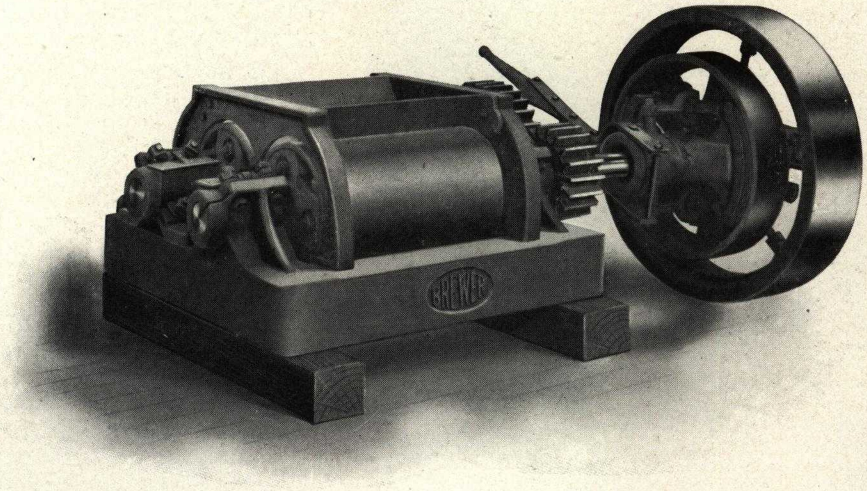
WHERE there are no large stones to be separated from the clay and a crusher of great capacity is required for clay grinding only, this straight roll pattern will be found to include all those features of strength, efficiency, and economy of operation which are expected to be present in high-grade machines for that purpose. The frame and one pair of journals are cast together in one piece, and are given such liberal proportions that breakage is impossible, while all other parts are equally well provided with strength and rigidity.

The rolls are of the removable shell construction illustrated upon preceding pages of this issue, and the material from which the shells are made is white-iron, the hardest and toughest substance practicable to incorporate in such parts. They are driven at differential speeds so that they have a disintegrating rather than a rolling effect upon the clay, or, if desired, at the same speed, and one roll is adjustable in and out for fineness of grinding. The roll scrapers are both cast together in one piece, and when worn may be quickly repaired by bolting or riveting strips of steel to the working sides. They are adjustable from above without getting underneath the machine.

The dividing lines between the boxes and caps are inclined at an angle of 45 degrees for the purpose of throwing the pressure of the shafts well into the boxes and caps as would be the case if journals were parted horizontally.

Specifications

Weight—6,200 pounds.
Floor Space—4 ft. 8 in. x 9 ft. 5 in.
Height—31 in., without skids.
Shafts—4 in. diameter, steel.
Rolls—24 in. diameter, 30 in. face.
Gears—5 in. face, 1¾ in. pitch, semi-steel.
Journals—12 in. long.
Outboard Bearing—Pillow block.
Driving Pulley—Friction clutch, Type B, 36 in. diameter, 12 in. face.
Speed—300 revolutions per minute.
Capacity—10,000 brick per hour.



No. 73 Straight Roll Crusher

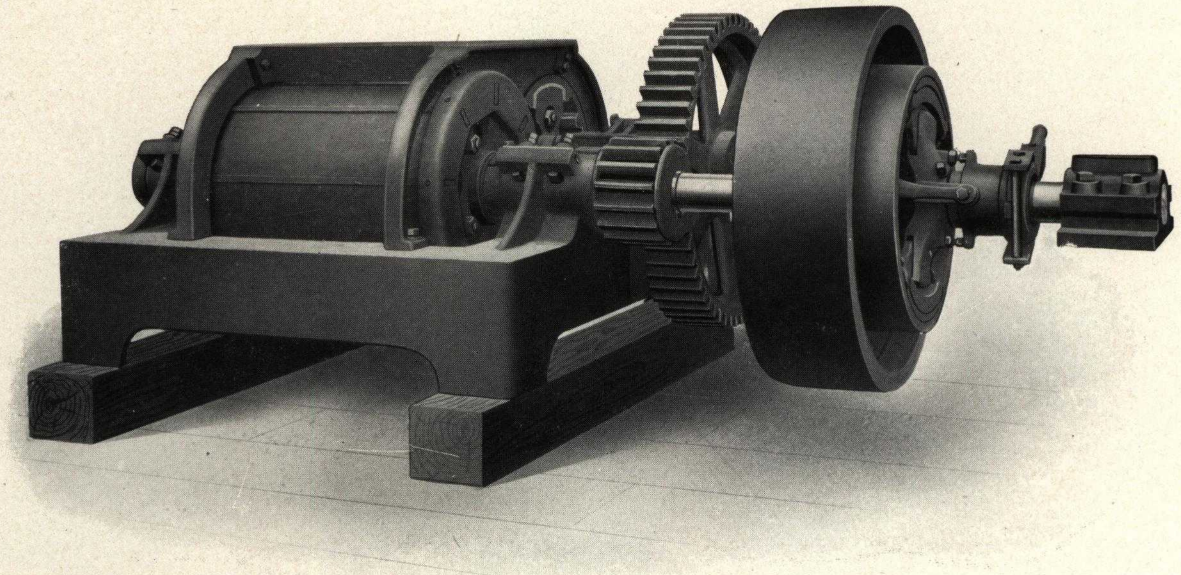
IN design and construction this machine is the same as the No. 16, but it is smaller and of less capacity. In proportion to its size and capacity it is as heavy as the larger model, and it is strictly a high-grade crusher in every respect.

The rolls are of the removable shell construction illustrated elsewhere, and the material from which the shells are made is white iron, the hardest and toughest substance practicable to incorporate in such parts. They are driven at differential speeds so that they have a disintegrating rather than a rolling effect upon the clay, or at the same speed if desired, and one roll is adjustable in and out for fineness of grinding. The roll scrapers are both cast together in one piece, and when worn, may quickly be repaired by bolting or riveting strips of steel to the working sides. They are adjustable from above without getting underneath the machine.

The dividing lines between the boxes and caps are inclines at an angle of 45 degrees, for the purpose of throwing the pressure of the shafts well into the boxes instead of upon the dividing lines between the boxes and caps, as would be the case if journals were parted horizontally.

Specifications

WEIGHT—2,300 pounds.
FLOOR SPACE—3 ft. 4½ in. x 7 ft. 1½ in.
HEIGHT—Bottom of foot to top of hopper, 1 ft. 8 in.
SHAFTS—2⅞ in. diameter, steel.
ROLLS—12 in. diameter, 22 in. face.
GEARS—4½ in. face, 1½ in. pitch, semi-steel.
JOURNALS—9 in. long.
OUTBOARD BEARING—Pillow block.
DRIVING PULLEY—Friction clutch, Type B, 34 in. diameter, 8 in. face.
CAPACITY—3,500 brick per hour.
SPEED—300 revolutions per minute.



No. 15 Disintegrator

THE size, weight, and great capacity of this Disintegrator, together with the improved design and construction of the rolls, demand special attention from those who have severe requirements to be met by a machine of that character.

The base or frame, together with one pair of journals, is included in a one-piece casting of ample weight and strength to withstand the heavy stress frequently brought to bear upon it, and the divisions between the boxes and caps are made on a line inclined from the center so that the thrust of the shafts is thrown well into the boxes instead of to the point of division between boxes and caps, as would be the case were the journals parted on a horizontal line according to earlier practice.

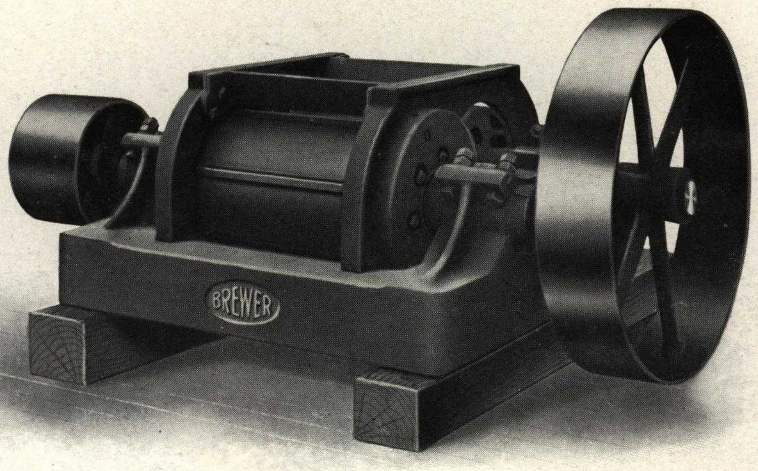
The disintegrating roll is of such construction that the lateral cutting bars may be set out and reversed as they wear, or quickly replaced with new ones when worn out. These bars are made of tool-steel of a standard size, and have only to be cut to proper length to be ready for use. The face of the roll between the cutting bars is made up of white-iron staves which, when worn, can be quicky replaced with others at a nominal cost. The outer shell of the feed roll is also of white-iron and removable, and thus the wear upon the whole machine is confined to parts which not only have great wear resisting qualities, but which, when finally worn, may be easily replaced without great expense.

The feed-roll journals are machined to the frame, are provided with ample in and out adjustment for fineness of grinding, and are retained in their desired position by heavy draw-bolts.

Especial attention is directed to the pages elsewhere in this issue which are devoted to the subject of Crushing Rolls with Removable Shells.

Specifications

WEIGHT—6,200 pounds.
FLOOR SPACE—4 ft. 8 in. x 9 ft. 5 in.
HEIGHT—31 in., without skids.
SHAFTS—4 in. diameter, steel.
FEED ROLL—20 in. diameter, 24 in. face.
DISINTEGRATING ROLL—20 in. diameter, 24 in. face.
GEARS—5 in. face, 1¾ in. pitch, semi-steel.
JOURNALS—12 in. long.
OUTBOARD BEARING—Pillow block.
DRIVING PULLEY—Friction clutch, Type B, 36 in. diameter, 12 in. face.
SPEED—325 revolutions per minute.
CAPACITY—10,000 brick per hour.



No. 72 Disintegrator

Although smaller in size and lighter in weight, this Disintegrator involves identically the same design and construction as the No. 15 pattern, except in those details which are necessarily different on account of size. The smaller diameter of the disintegrating roll makes a higher speed necessary to obtain the same speed of the cutting bars, and on that account provisions are made for driving with two belts.

The frame, together with one pair of journals, is included in a one-piece casting of ample strength and the divisions between the boxes and caps are made on a line inclined from the center so that the thrust of the shafts is thrown well into the boxes instead of to the point of division between boxes and caps.

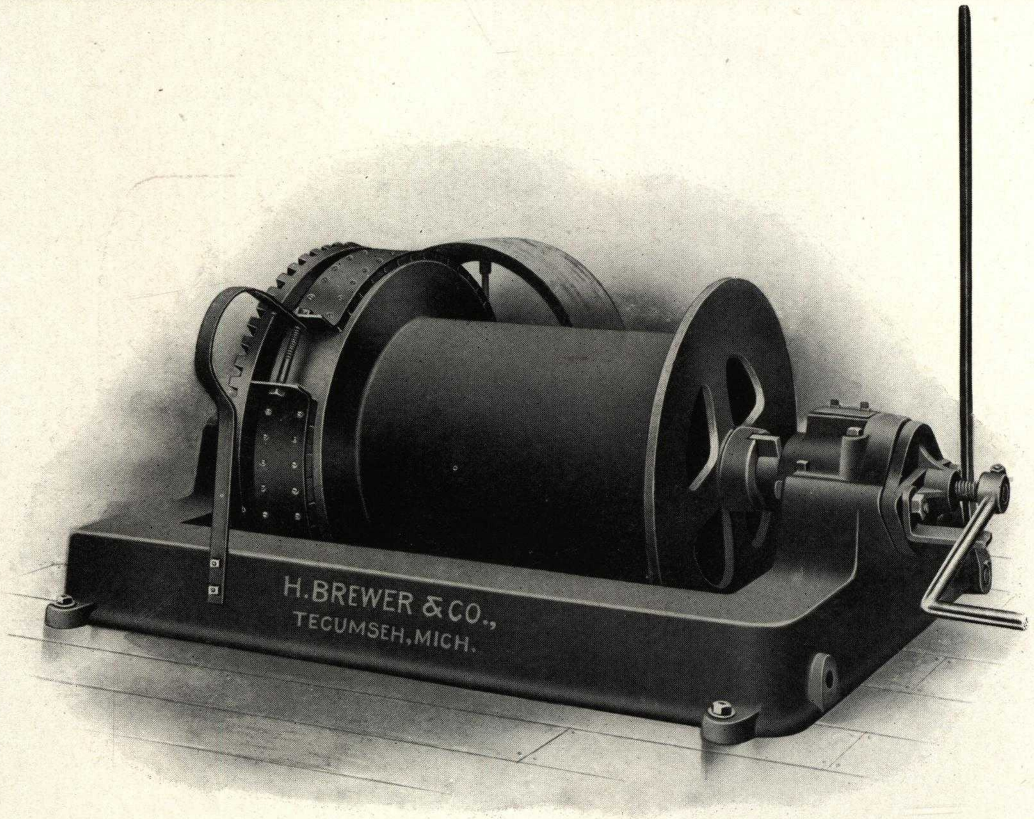
The disintegrating roll is of such construction that the lateral cutting bars may be set out and reversed as they wear, or quickly replaced with new ones when worn out. These bars are made of tool-steel of a standard stock size, and have only to be cut to proper length to be ready for use. The face of the roll between the cutting bars is made up of white-iron staves which, when worn, can be quickly replaced with others at a nominal cost. The outer shell of the feed roll is also of white-iron and removable, and thus the wear upon the whole machine is confined to parts which not only have great wear resisting qualities, but which may be easily replaced without great expense.

The feed-roll journals are machined to the frame, are provided with ample in and out adjustment for fineness of grinding, and are retained in their desired position by heavy draw-bolts.

Especial attention is directed to the pages elsewhere which are devoted to the subject of Crushing Rolls with Removable Shells.

Specifications

WEIGHT—2,000 pounds.
FLOOR SPACE—3 ft. 4 in. x 4 ft. 10 in.
HEIGHT—Bottom of foot to top of hopper, 1 ft. 8 in.
SHAFTS—2⅞ in. diameter, steel.
FEED ROLL—12 in. diameter, 18 in. face.
DISINTEGRATING ROLL—12 in. diameter, 18 in. face.
JOURNALS—9 in. long.
DRIVING PULLEYS—Plain, 30 in. diameter, 6 in. face, and 12 in. diameter, 8 in. face.
SPEED—900 and 100 revolutions per minute.
CAPACITY—3,500 brick per hour.



No. 28 Bevel Geared Hoisting Drum

WHERE a bevel-geared hoist is required, the No. 28 is offered as a strictly high-grade, heavy-duty machine. It is of the same general pattern as the No. 27, illustrated and described upon a following page, and differs from it only in the method of gearing.

The mechanical action of these hoists is as follows: The gear is rigidly attached to the drum shaft, and has firmly bolted to it a friction ring of hardwood which is the shape of a frustum of a cone. The drum is loose upon the shaft, and has in one end of it a depression or recess of the same shape as the friction ring referred to above. When it is desired to make the drum operative, it is forced into contact with the friction ring by means of a heavy screw provided with a crank handle which passes through a large nut attached to the frame. Around the shaft, between the gear and the drum is a powerful spiral spring, which, when the screw is turned backward, disengages the drum from the gear, leaving the former stationary, while the latter continues to revolve as before. The brake-band is lined with hardwood, and is made of two pieces connected at one end with a long take-up bolt, at the other by a bell-crank mounted upon a rock-shaft to which is keyed the long vertical lever. The purpose of the brake is to control the speed of the empty cars down the incline and sometimes to hold loaded cars stationary at some point during their ascent.

Provisions are made for a drum ratchet and dog, to be operated by a separate lever, by means of which the drum may be held stationary without the brake. This attachment is special and subject to an extra charge.

The standard machines carried in stock are built upon left-hand frames, as shown in cut, but special machines upon right-hand frames can be built to order. These special machines have the driving pulley located upon the front left-hand corner of the frame instead of the rear left-hand corner, as shown in cut.

Specifications

DRUM—20 in. diameter, 28 in. between flanges, cast in one piece.

FLANGES—30 in. diameter.

GEARS—4 in. face, 1½ in. pitch, semi-steel.

DRUM SHAFT—3½ in. diameter.

DRIVING SHAFT—2½ in. diameter.

BEARINGS—Self-oiling.

BRAKE LEVER—May be placed on either side of drum crank.

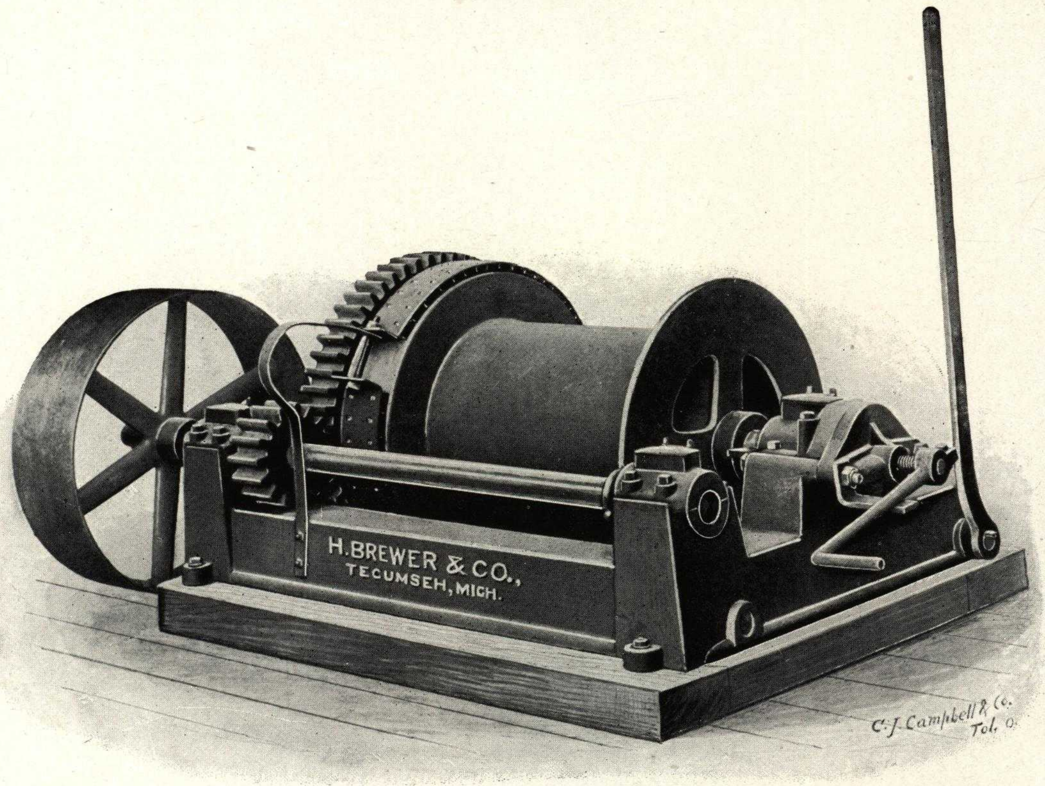
BRAKE BAND—5 in. wide.

FRAME—64 in. long, 54 in. wide, cast in one piece.

DRIVING PULLEY—30 in. diameter, 10 in. face.

SPEED—250 to 300 revolutions per minute.

WEIGHT—3,000 pounds.


H. BREWER & CO.,
TECUMSEH, MICH.
C. J. Campbell & Co.
Tol. O.

No. 27 Spur Gear Hoisting Drum

THIS is distinctly a high-grade machine of most modern construction, and under no circumstances would a person be warranted in a desire for anything larger, heavier, or stronger for any ordinary brickyard purpose. It is a new pattern, built much better than is usual with such machines, and incorporates a number of features which make it more than ordinarily desirable and convenient to operate.

All bearings are self-oiling, providing ample lubrication at all times with only casual attention. The frame and drum are both one-piece castings, insuring rigidity and strength impossible to obtain where several members are machined and bolted together. The friction surface is greater and the brake band one inch wider than that of any other drum of its weight, providing for the maximum tractive power and making complete control of the empty cars down the incline easy and sure. The weight of the brake band is sustained, when not operative, by a goose-neck spring, which not only avoids unnecessary wear upon the lining, but permits the easy starting of the empty cars while yet on the level. The brake lever can be placed on either side of the drum crank, as desired.

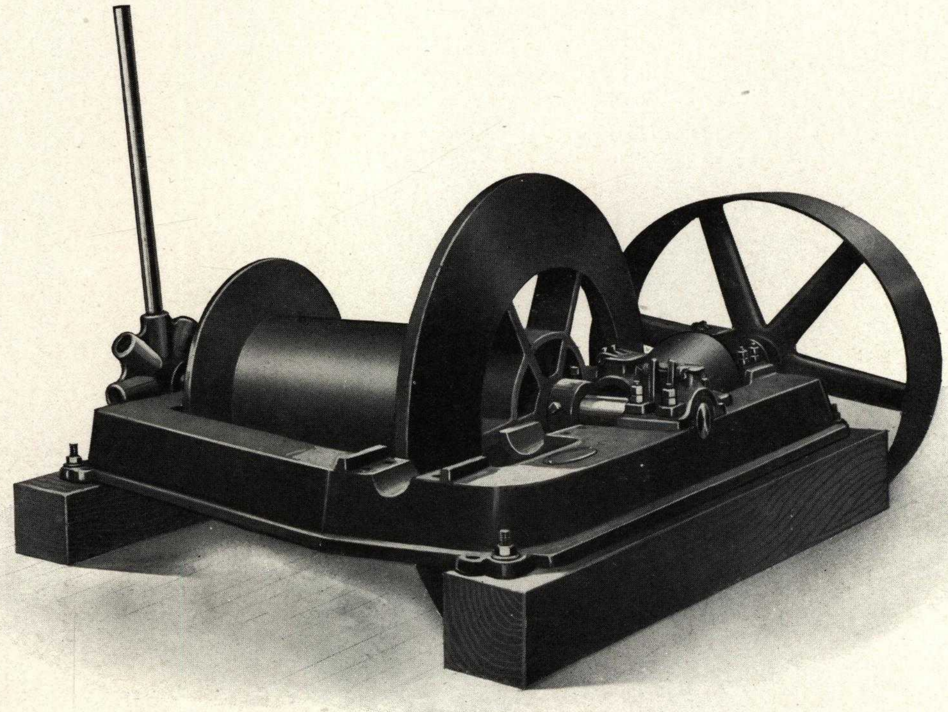
Provisions are made for a drum ratchet and dog, to be operated by a separate lever, by means of which the drum may be held stationary without the brake. This attachment is special, and subject to an extra charge.

The standard machines carried in stock are built upon right-hand frames, as shown in the cut, but special machines upon left-hand frames can be built to order. These special machines have the driving pulley, shaft, and bearings located upon the rear side of the frame instead of the front side as shown in cut.

If a bevel-geared hoist is required, see illustration and description of the No. 28 upon a preceding page, where may also be found a description of the mechanical operation of both the No. 27 and No. 28 patterns which are alike except in the method of gearing.

Specifications

Drum—20 in. diameter, 28 in. between flanges, cast in one piece.
Flanges—30 in. diameter.
Gears—4 in. face, 1¾ in. pitch, semi-steel.
Drum Shaft—3½ in. diameter.
Bearings—Self-oiling.
Driving Shaft—2½ in. diameter.
Brake Band—5 in. wide.
Frame—64 in. long, 54 in. wide, cast in one piece.
Brake Lever—May be placed on either side of drum crank.
Driving Pulley—30 in. diameter, 10 in. face.
Speed—250 to 300 revolutions per minute.
Weight—3,000 pounds.



No. 22 Bevel Friction Hoisting Drum

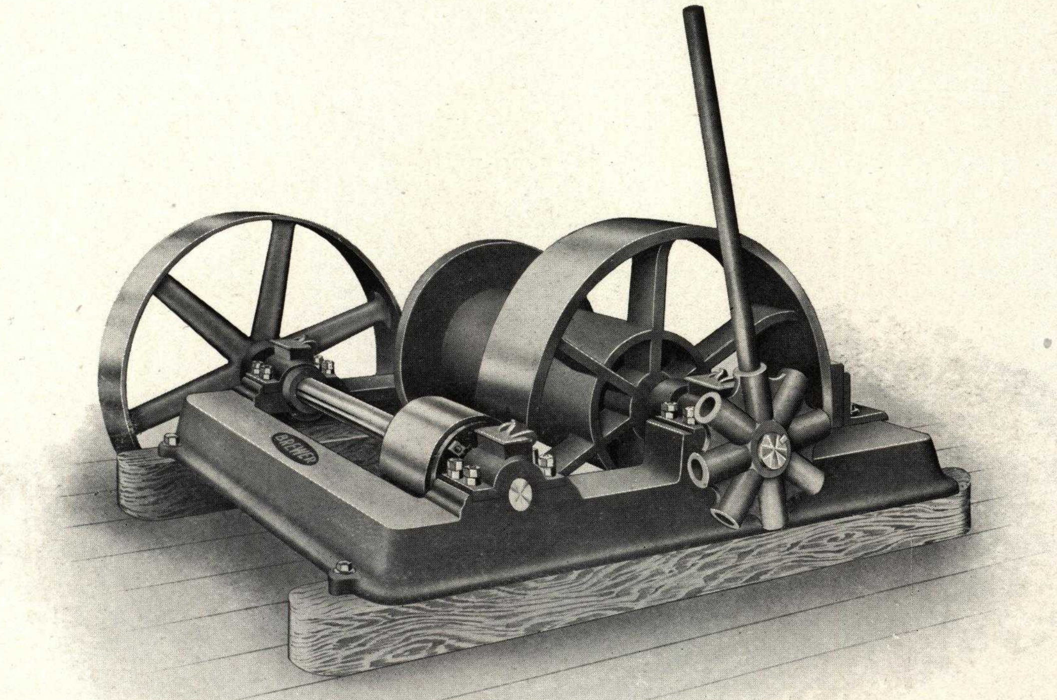
ALTHOUGH lighter in weight and of smaller dimensions than the No. 28 Bevel Geared Hoisting Drum shown elsewhere, this pattern is of the same relative strength and capacity. It is designed for use where less material is to be handled and the larger investment for the heavier machine is unnecessary.

The frame, which is of liberal proportions, is cast in one piece, and is provided with boxes for the driving shaft upon both sides of the drum, so that the machine may be driven from either side without changes save those which can be made by any ordinary mechanic. The drum, friction-wheel, and brake-band are all cast together in one piece, and one lever operates both the friction and the brake by movement in opposite directions respectively.

The drum shaft has no rotary motion at any time, but the drum revolves upon it in either direction. Near one end of this shaft is cut a very coarse helix or spiral while one of the parts which has the appearance of a journal box is a stationary nut. A multiple lever socket upon the end of the shaft permits the lever to be placed in the most convenient position at any time, and only slight movements of the lever are necessary to bring either the friction or brake surfaces in contact where they will remain without further effort of the operator until released, thus making unnecessary the drum ratchet and dog operated by a separate lever sometimes required upon such machines.

Specifications

WEIGHT—1,600 pounds.
DRUM—12 in. diameter, 22 in. between flanges.
FLANGES—22 in. diameter.
FRICTION WHEELS—7 in. face.
DRUM SHAFT—2⅞ in. diameter.
DRIVING SHAFT—2¼ in. diameter.
BEARINGS—5 in. long, self-oiling.
BRAKE SURFACE—6 in. wide.
FLOOR SPACE—75 in. x 56 in.
DRIVING PULLEY—Plain, 30 in. diameter, 8 in. face.
SPEED—250 to 275 revolutions per minute.



No. 37 Spur Friction Hoisting Drum

In all but very large plants, this hoist will be found to be of ample weight and strength, and to incorporate all the features of high-grade construction to be found in the larger machines. The frame and all journals are cast together in one piece, and the drum, flanges, and friction-wheel are also combined into a single casting. The drum shaft is eccentric where it passes through its journals; and the drum, which is free to revolve upon its shaft, is shifted toward the small paper friction-wheel or the brake block by slight movements of the lever in one direction or the other. The lever socket is of a multiple type and the lever may be located in any desired position without difficulty.

Specifications

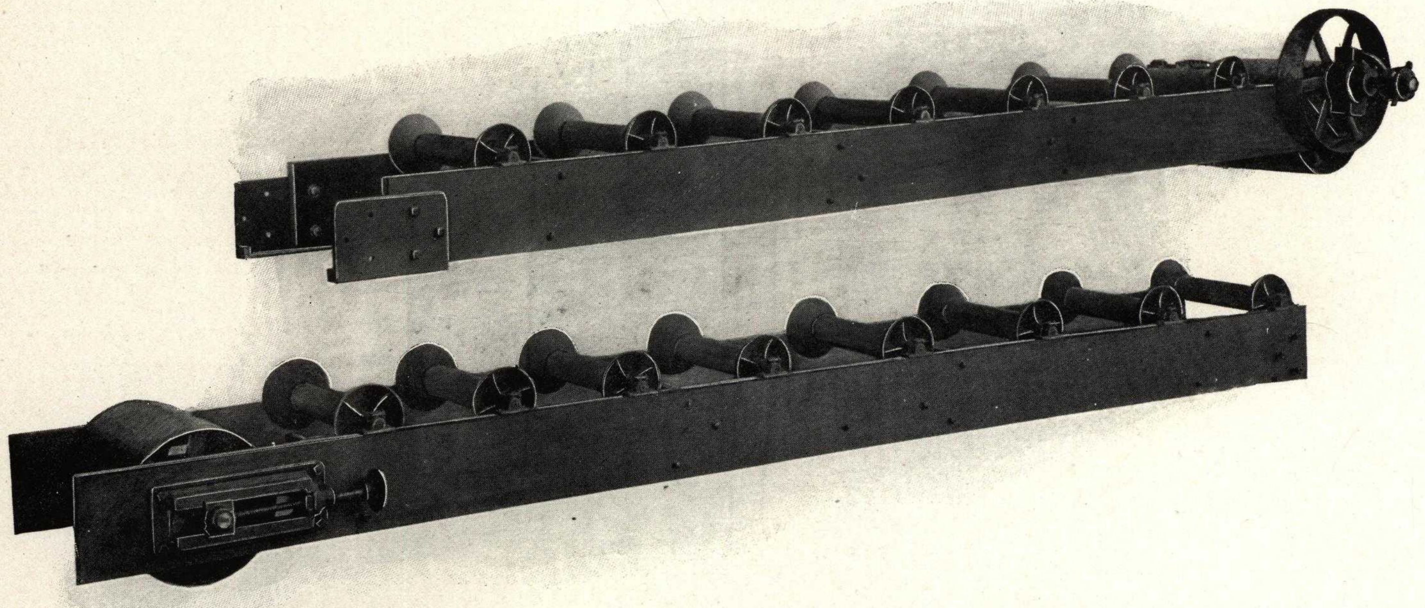
Weight—1,600 pounds.
Floor Space—58¼ in. x 65¾ in.
Shafts—Drum, 3 in. diameter, steel.
Driving, 2¼ in. diameter, steel.
Drum—12 in. diameter, 22 in. between flanges.
Flanges—22 in. diameter.

Friction Pulleys—Iron, 30 in. diameter, 8 in. face.
Paper, 8 in. diameter, 8 in. face.

Journals—5 in. long.

Driving Pulley—Plain, 30 in. diameter, 8 in. face.

Speed—300 revolutions per minute.



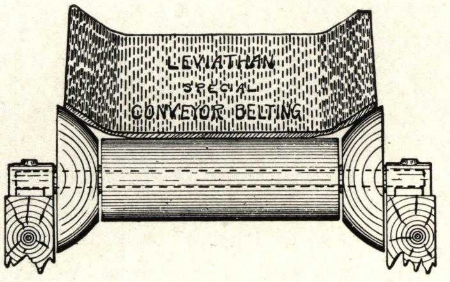
No. 78 Geared Conveyer

CONVEYORS of 24 inches width, irrespective of length, are built after the pattern illustrated above, with concentrating rolls and flexible hinged-edge belt, and without side boards or guards of any description. The belt is omitted from the illustration to give a better view of the rolls, but the small sketch shows the construction of it. The body and edges are 5-ply, while the hinge or joint is 3-ply, allowing the belt to conform with the shape of the rolls.

The concentrating rolls are mounted upon 1-inch shafts which run in bored bearings 2 inches long. The center or rigid portion is made of a steel tube 4 inches in diameter and the bell-shaped flanges, which are 9 inches in diameter, with hubs 4 inches long, are bored to run freely upon the shafts. This method of construction not only allows the belt to assume a trough-like shape when loaded, thus preventing the clay from falling off the sides, but eliminates all unnecessary wear upon the belt and assures an even discharge of the material over the head drums of the conveyor.

The frame is built in 15-foot sections with 2 x 12 side rails joined every four feet with 2 x 12 girts and two 2 x 6 cross braces. The sections are joined by substantial cast-iron splice plates securely bolted, flanged over the edges and notched into the side rails, making a rigid and reliable connection.

The drums are both solid iron pulleys, and are supplied with adjustable scrapers which prevent the accumulation of clay upon them. There is also provided a suspended belt scraper which removes and discharges outside the belt any clay which may adhere to the interior surface of it. The lower drum is journaled in take-up bearings having liberal adjustment, and the bearings of the upper drum are contained in a heavy gear frame.



These conveyors are built of any length to suit the purchaser, and may be set horizontally or upon any incline the pitch of which does not exceed 6 inches rise per foot of length.

Specifications

Weight—Head and foot, 950 pounds. Add for each foot of length, 35 pounds

Belt—24 inches wide, 5-ply, stitched canvas.

Driving Pulley—Friction clutch, 24 inches diameter, 5 in. to 7 in. face, according to length of conveyor.

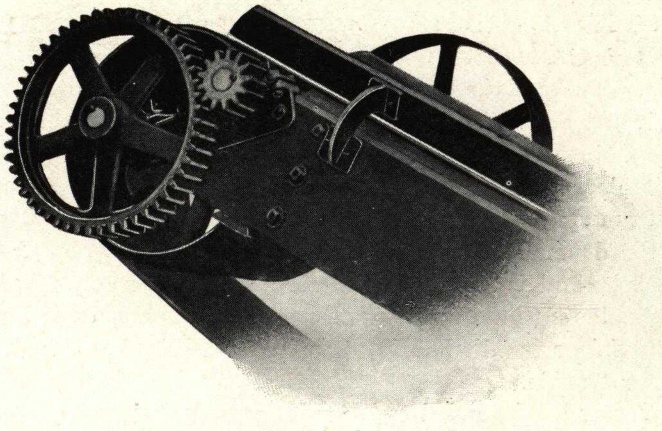
Speed Driving Pulley—80 to 100 revolutions per minute.

Gears—$2\frac{3}{4}$ in. face, $1\frac{1}{8}$ in. pitch. Ratio, 4 to 1.

Shafts—Driving, 2 in. diameter.
Head, $1\frac{3}{4}$ in. diameter.
Foot, $1\frac{3}{4}$ in. diameter.

Drums—Head, 20 in. diameter, crown face.
Foot, 18 in. diameter, crown face.

No. 68 Geared Conveyor



No. 68. Head

CONVEYORS of 18 inches width and between 20 and 50 feet length are built after the No. 68 pattern, the head and foot of which are illustrated by these engravings. If 18-inch conveyors of a length less than 20 feet are desired, the No. 58 may be substituted when selecting machinery for small factories, but if greater quantities of material are to be handled, this No. 68 pattern is a more desirable selection even for the shorter lengths.

The head or driving end of this conveyor is geared, and the driving pulley is of a substantial friction clutch pattern. The construction of the frame is very rigid; and the splices, which long conveyors may require, are heavy and reliable. Suitable side guards, scrapers and take-up boxes are also provided. For handling moist clay in quantities required for 4,000 brick per hour, or less, is the purpose for which this No. 68 pattern is intended. It may be set either horizontally or on an incline, the pitch of which does not exceed 6 inches rise per foot of length.

Specifications

Weight—Head and foot, 700 pounds. Add for each foot of length, 26 pounds.

Belt—18 inches wide, 4-ply, stitched canvas.

Driving Pulley—Friction clutch, 24 in. diameter, 4 in. face.

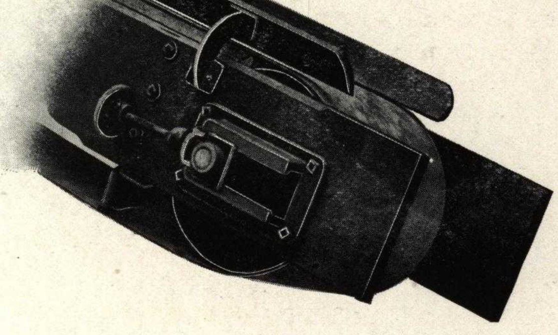
Speed Driving Pulley—80 to 100 revolutions per minute.

Gears—2¾ in. face, 1⅛ in. pitch. Ratio, 4 to 1.

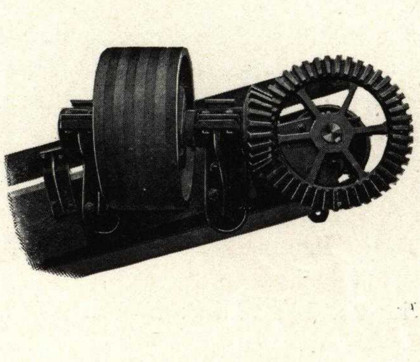
Shafts—Driving, 2 in. diameter.
Head, 1¾ in. diameter.
Foot, 1¾ in. diameter.

Drums—Head, 20 in. diameter, crown face.
Foot, 18 in. diameter, crown face.

No. 68. Foot

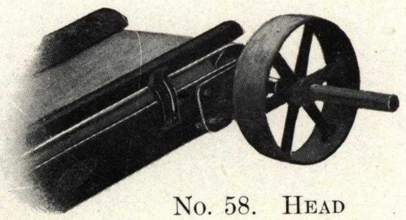


No. 43 Bevel Geared Driving Attachment



WHEN it is necessary to place the No. 58 Conveyor in a position parallel with the line shaft, this bevel-geared driving attachment serves as a convenient means of applying the necessary power. It is so designed that its position may be shifted to correspond with the angle at which the conveyor is set, and will provide for horizontal or any reasonable incline of location. Driving pulley, 14 inches diameter, 4 to 6 inches face, according to length. Weight, 125 pounds. Speed of driving shaft, 150 revolutions per minute.

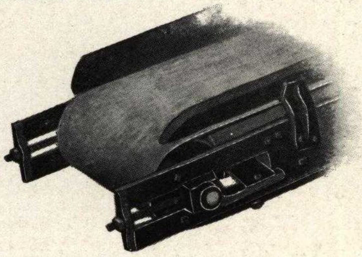
No. 58 Plain Conveyor



No. 58. Head

CONVEYORS of 18 inches width, and less than 20 feet length, are built after the pattern illustrated by the engravings herewith. Wider or longer conveyors are of different construction, and are fully illustrated and described elsewhere. The No. 58 pattern is of simple and reliable construction, and when length does not exceed the above specification is suitable for small factories where the amount of clay to be handled is not great. It is driven by a plain pulley upon the upper drum shaft without clutch or gearing; is provided with suitable guards throughout its length, which not only prevent the clay from spilling over the sides, but keep the belt centrally located upon the drums; has take-up boxes at the foot to allow for stretch of the belt, and is supplied with scrapers for removing any clay which may adhere to the inside of the belt or to the faces of the drums, with provisions for discharging this clay outside where it will cause no further trouble.

No. 58. Foot



These conveyors are intended to be used for carrying moist clay. They will give good service when set horizontally or on an incline, the pitch of which does not exceed 6 inches rise per foot of length.

Specifications

Weight—Average per foot, 50 pounds.

Belt—18 inches wide, 4-ply stitched canvas.

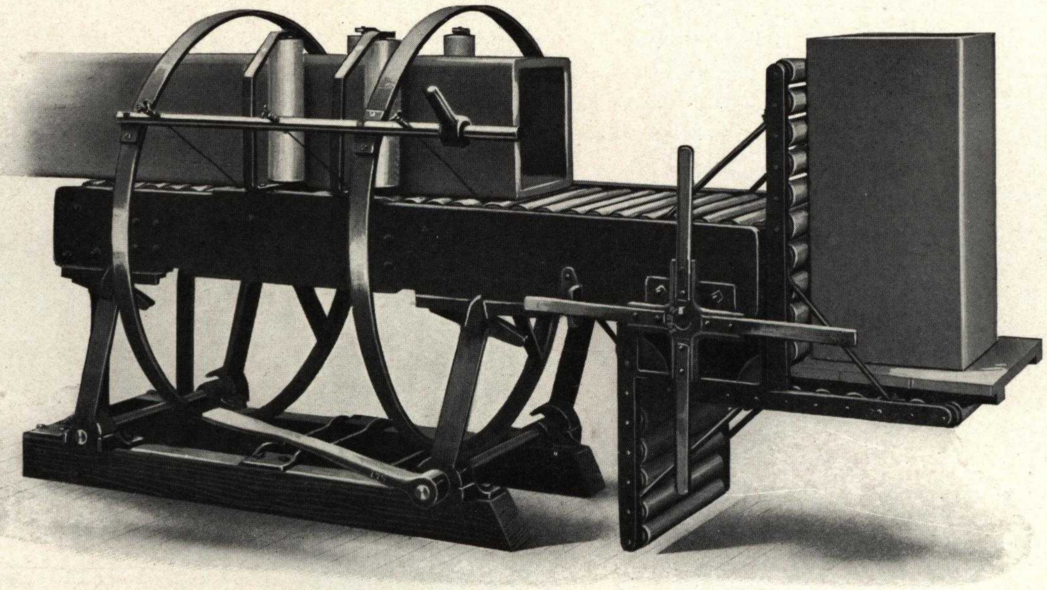
Driving Pulley—Plain, solid iron; 16 in. diameter, 4 in. face.

Speed Driving Pulley—100 revolutions per minute.

Shafts—Head, $1\frac{3}{4}$ in. diameter. Foot, $\frac{15}{16}$ in. diameter.

Drums—8 in. diameter, crown face.

No. 69 Dumping Hollow Block Cutter



THIS cutter is designed especially to handle the very large sizes of flue lining and fire-proofing which have to be dumped on pallet boards. The pallet board in position serves to measure the length of the ware to be cut and after cutting remains with the ware while the dumping table is revolved a quarter turn, which not only upends the severed portion, but brings another set of rolls in position for the next cut. If desired, two or more lengths of ware can be cut and dumped at one time.

Specifications

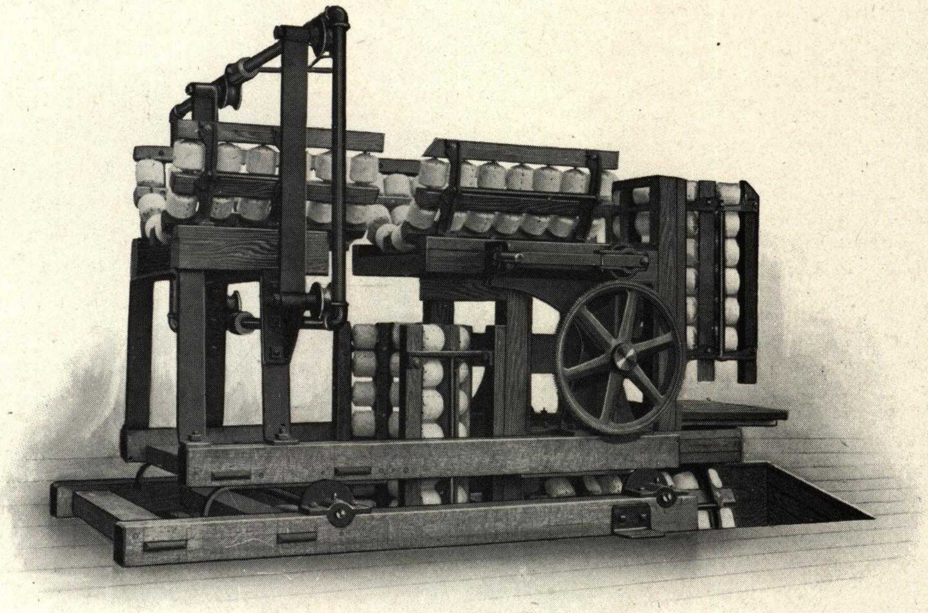
Weight—Crated, 970 pounds.

Length—Over all, including travel of table, 8 ft. 5 in.

Width—Over all, 43 inches.
Of table, $28\frac{1}{2}$ inches.

Height—Over all, $48\frac{1}{4}$ inches.
To top of table, $29\frac{5}{8}$ inches.

Capacity—14 x 14 inches, 18 x 13 inches or smaller.



No. 87 Rotary Dumping Cutter.

THE special purpose of this Cutter is the rapid cutting and handling of large outputs of 8-inch, 10-inch, and 12-inch drain tile in double length when produced horizontally. One man does the cutting and dumping, the latter being accomplished by a single turn of the crank handle; and two men transfer the tile from the Cutter to the truck, taking them just as they reach a convenient height. Double-length tile at the rate of fifteen pieces per minute have been easily and steadily handled in this manner with ample time for the operator to insert the pallets. The column is well supported and the liability of roller marks reduced to a minimum.

While primarily intended for the sizes of drain tile mentioned, the machine is adapted to many different kinds and shapes of ware which are best handled on pallets. Various kinds of roller platens and supporting devices are substituted for the troughs which are removable. Arrangements may be made to accommodate a column 18 inches by 18 inches in cross-section.

Specifications.

WEIGHT—Without troughs, net 725 pounds. Crated, 975 pounds. Troughs, per set, 250 pounds.

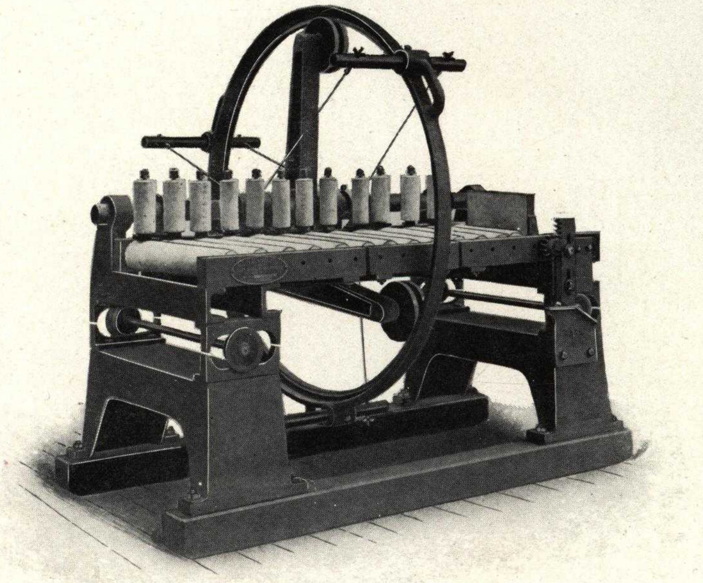
LENGTH—Over all, including travel, 90 inches.

WIDTH—Over all, including clearance both ways for cutting frame, 88 inches.

HEIGHT—From floor to lowest edge of die, 32 inches.

ROLLS REQUIRED—8-inch set, 136; 10-inch set, 170; 12-inch set, 204.

No. 33 Rotary Hollow Block Cutter



THIS machine is designed for cutting hollow blocks, fire-proofing flue-lining, book-tile, bench-tile, etc., up to 12 x 12 inches in size, and may be readily adapted to the requirements of those factories which produce special work such as radius blocks for stacks, grain elevators, and ware of a similar nature. It is thoroughly modern in its construction, is heavy enough to stand hard work and some abuse, but is light enough to be readily moved. As shown by the engraving, it is provided with an automatic end gate to measure the forward piece of ware of the cut, but when desired a suitable dumping device for the larger sizes is furnished.

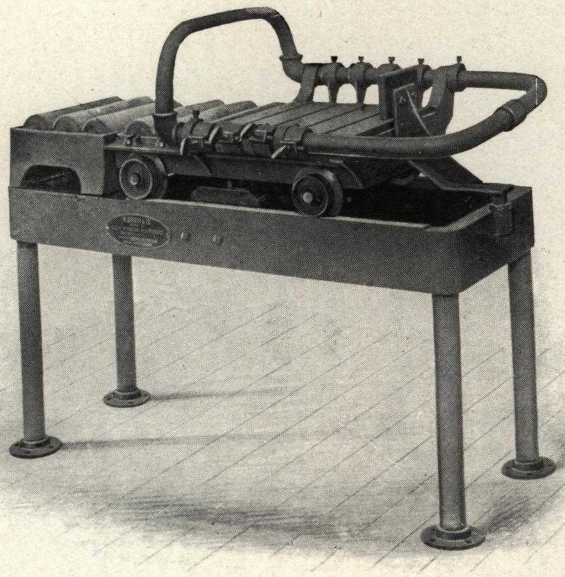
Specifications

LENGTH—Over all, 49½ inches.
HEIGHT—Over all, 47 inches.
Height from bottom of skid to top of rolls, 24 in.

WIDTH—Over all, 43½ inches.
WEIGHT—550 pounds.

No. 47 Hand Brick Cutter

TO supply the demand from small yards for a low-priced hand cutter for side cut brick which is durable and rapid, this little device has been designed with all the care usually exercised in the development of larger machines. It is built entirely of iron and steel; is heavy enough to be thoroughly substantial; light enough to be easily moved; is distinctly down cut in action; and the wires have a decided shearing movement as they pass through the clay. It cuts four brick at a time, and is capable of being operated at the rate of 3,000 bricks per hour by a person with a little experience.

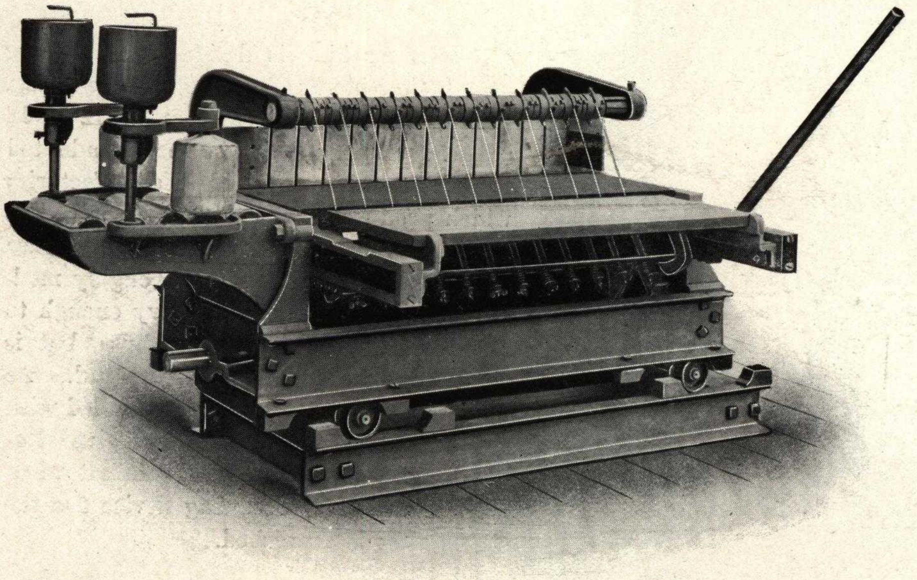


In cases where the output is so small that one person is expected to cut and set the brick upon the truck, this machine will be found especially convenient, for, after the wires have passed through the column, the severed bricks remain in such a position that they are readily accessible and easy to handle.

Suitable lubricating rolls are provided as well as an automatic stop or gate to measure the last brick of the cut, but no side guides of any sort are used. The whole machine is self-contained and can be made either right hand or left hand in a few moments without the use of any special tools.

Weight complete as shown, 275 pounds. Orders should specify thickness of cut.

No. 32 Board Delivery Brick Cutter

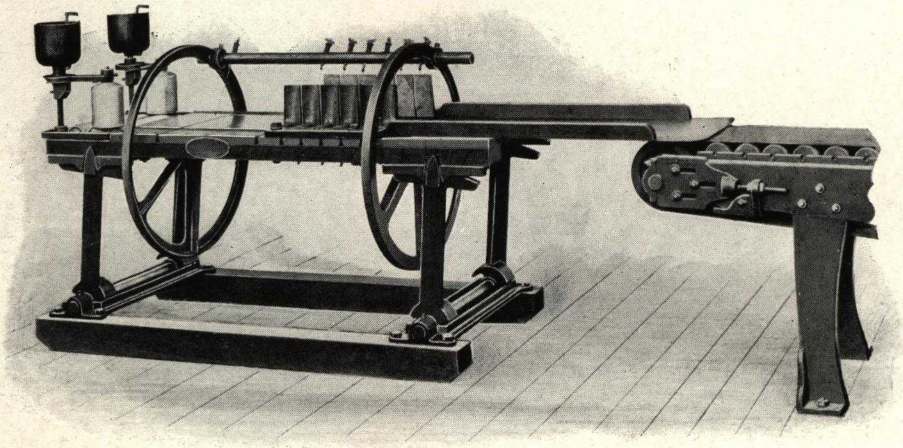


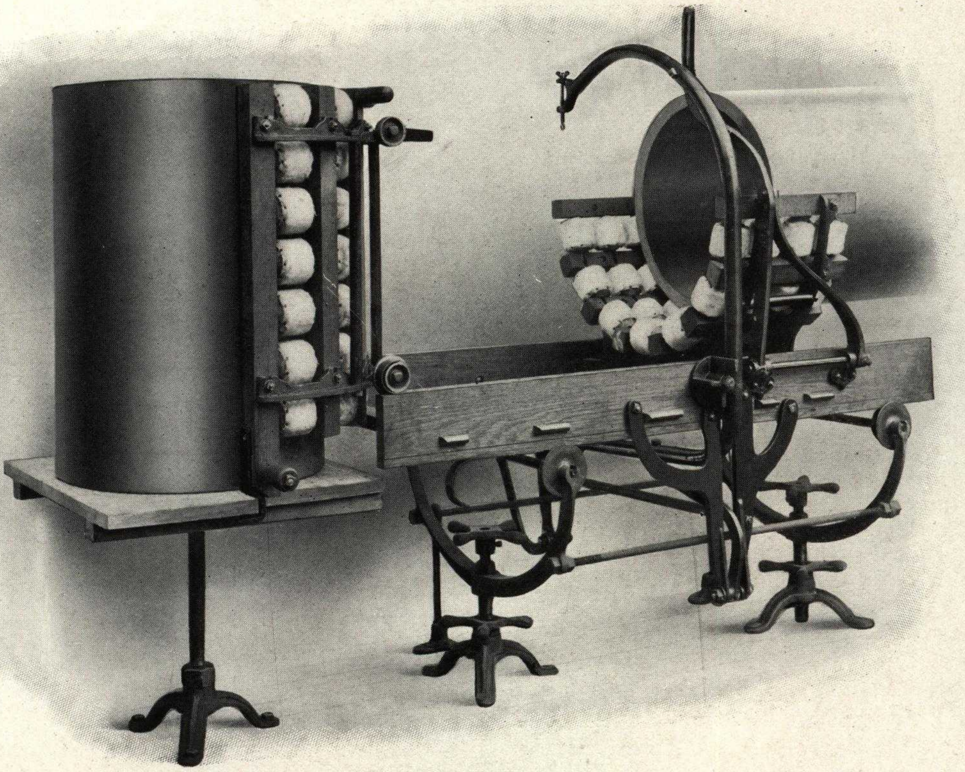
IN the operation of the board delivery brick cutter the wires are passed through the column of clay and a pallet board drawn under the severed portion of it by a movement of the hand-lever in one direction, while movement in the other direction delivers the pallet board with the bricks upon it to the position originally occupied by the empty board and replaces the wires ready for the succeeding cut. The board full of cut bricks is removed, another empty board substituted, and the process repeated.

The construction of this cutter is all iron and steel of sufficient weight and strength to insure durability and rapid operation. The wire holders are capable of quick and convenient manipulation, and the wires are set obliquely in reference to the position of the clay column so that they have a shearing passage through it. The oil rolls are attached to the reciprocating portion of the machine, and are constantly in contact with the column, and by changing ends with the oil pan and operating lever the machine can be made either right-hand or left-hand without extra parts or the use of any special tools. Twelve brick of average thickness are cut at a time, and under ordinary conditions the cutter is good for 5,000 brick per hour rate. Weight, 885 pounds. Orders should specify thickness of cut desired.

No. 38 Hand Brick and Hollow Tile Cutter

IN cases where a low-priced hand cutter is required to cut a number of different kinds of ware the No. 38 will be found a very satisfactory device. It is capable of handling a large output, and delivers upon an off-bearing belt from which the ware is removed in the same manner as from an automatic machine. It will cut two lengths of 12-inch block, three lengths of end-cut brick at a time, using both the backward and forward motion of the reel frame. If the output is limited, and it is necessary to have one man do both the cutting and the setting off, the off-bearing belt is not needed; but if the quantity of ware being made is large enough to keep the man at the cutter busy, or if the ware is to be put through a power re-press, the off-bearing belt is used to great advantage. Suitable lubricating rolls for both sides and bottom of the column are provided, and arrangements are made whereby the waste oil is collected and used over again. Off-bearing table pulley 16 in. diameter, 4 in. face. Speed 20 to 40 revolutions per minute. Weight of cutter without off-bearing table, 550 pounds. Weight, 12-ft. off-bearing table, 350 pounds.

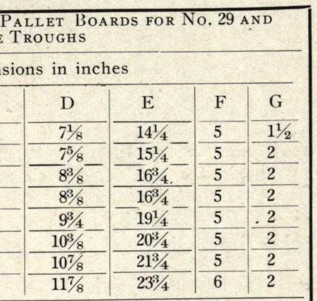




No. 29 Hand Tile Cutter

No. 29 and No. 39 Hand Tile Cutters

IN the production of the larger sizes of drain-tile with horizontal delivery machines these cutters afford a most convenient, economical, and rapid means of handling the ware. They are in extensive use and have given universal satisfaction throughout the territory where drain-tile are made. The two machines differ only in size. The No. 29 will cut 7, 8, 9, 10, and 12 inch tile, of single length, in plain roller troughs from which the ware is removed by formers described elsewhere, and 8, 9, 10, 12, 14 and 15 inch tile, of either single or double length in the roller dump troughs, by means of which the ware is deposited upon a pallet board, as shown in the engraving above. The No. 39 will cut 10, 12, 14, 15, 16, and 18 inch tile of either single or double length in the roller dump troughs, but is not recommended for the smaller sizes.



In the operation of these cutters with the roller dump troughs pallet boards are used at the ends of the troughs, which not only serve to measure the tile before cutting, but as a means of handling it after it is cut. When the plain roller troughs are used, the cutter is fitted with the No. 31 automatic gate, which measures the tile before cutting, but drops down out of the way when the cut is completed and the ware is to be removed.

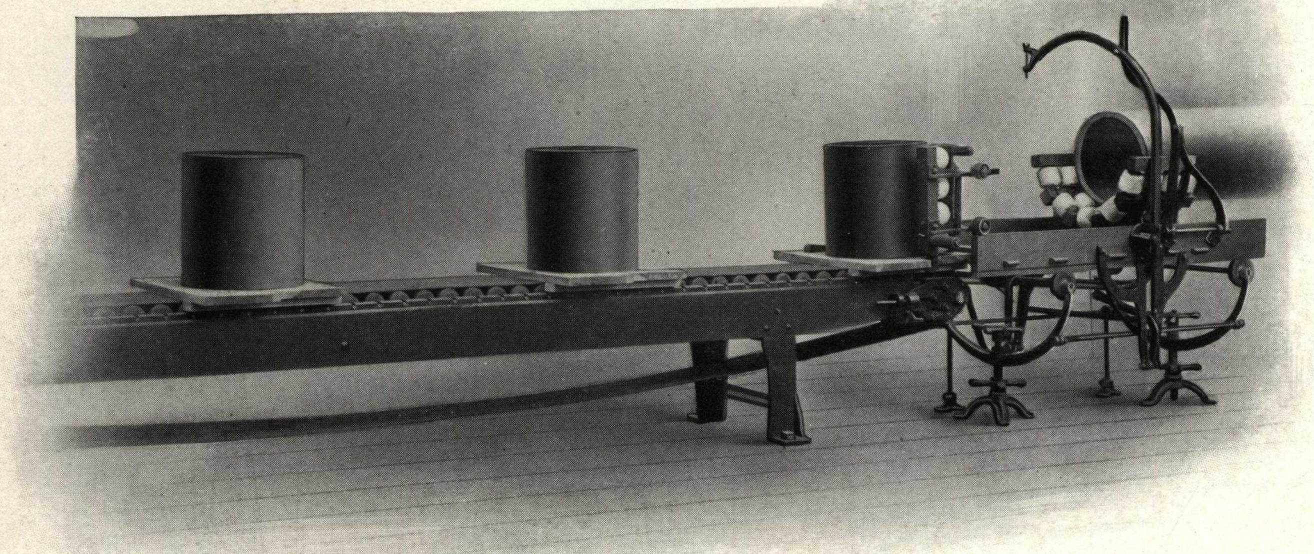
To enable the purchaser to anticipate the requirements in the direction of pallet boards, there is given herewith a sketch showing the shape, and a table of dimensions of all the different sizes. With this information in hand the operator may proceed to make up his pallet boards at his convenience.

Orders for troughs should specify whether the tile are to be cut single or double length and the exact length in inches in either case. The standard single length is assumed to be 13½ inches, and the standard double length 27 inches. It is intended to

TABLE SHOWING DIMENSIONS OF PALLET BOARDS FOR NO. 29 AND NO. 39 TILE TROUGHS

Size of Tlle	Dimensions in inches						
	A	B	C	D	E	F	G
8 in.	14¼	18¼	7⅛	7⅛	14¼	5	1½
9 in.	15¼	19¼	7⅝	7⅝	15¼	5	2
10 in.	16¾	20¾	8⅜	8⅜	16¾	5	2
12 in.	16¾	20¾	8⅜	8⅜	16¾	5	2
14 in.	19¾	23½	9¾	9¾	19¼	5	2
15 in.	20¾	24¾	10⅜	10⅜	20¾	5	2
16 in.	21¾	25¾	10⅞	10⅞	21¾	5	2
18 in.	23¾	27¾	11⅞	11⅞	23¾	6	2

Boards ⅞ inches thick—Cleats ⅞ inches thick, 2 inches wide



Method of handling 10 in. and 12 in. Drain Tile, single length, when produced in large quantities and dried upon cars

have in stock for prompt shipment standard single length plain roller troughs and standard double length roller dump troughs of the sizes mentioned above. Other sizes or lengths are made to order.

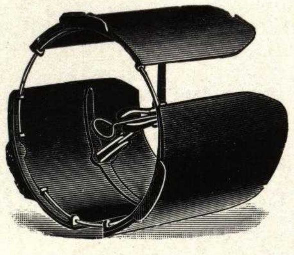
Table showing the number of rolls required for No. 29 and No. 39 Tile Troughs

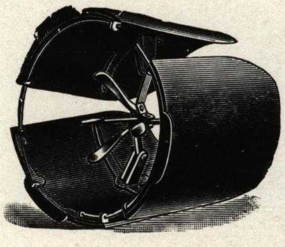
Size of Tile	Number rolls required		
	Plain roller troughs single length	Roller dump troughs single length	Roller dump troughs double length
6 in.	32		
7 in.	32		
8 in.	32	32	44
9 in.	40	40	55
10 in.	40	40	55
12 in.	48	48	66
14 in.		48	66
15 in.		56	77
16 in.		64	88
18 in.		72	99

By substituting suitable flat or special shaped troughs these cutters are also used for cutting large sizes of hollow blocks, dumping the ware upon pallet boards in a similar manner to that described above. Information in regard to this kind of work will be furnished upon receipt of sketches or patterns showing the size and shape of the ware to be produced.

In cases where 10 and 12 inch tile are produced in large quantities and are to be dried upon cars, it is customary to follow the idea illustrated by the accompanying engraving. The tile are cut single length in dumping troughs, and are deposited, pallet and all, upon an off-bearing belt, from which the tile only are removed by formers described elsewhere. The pallets are allowed to remain on the belt until they fall off the end of it in a pile, from which they are returned to the cutter to be used again. This system is in use successfully by a number of large operators.

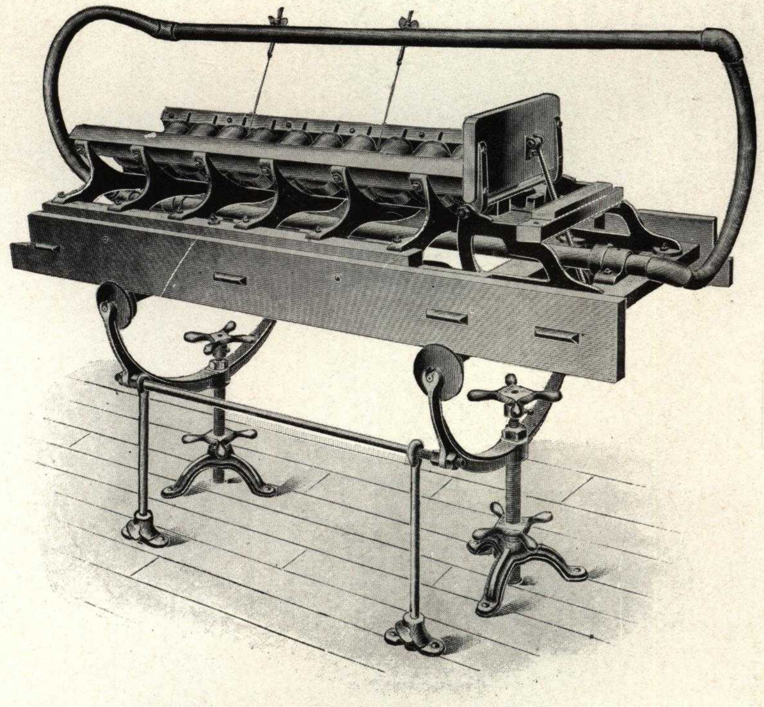
To make up a complete outfit of appliances to cut a certain variety of sizes, a set of standards, a cutter, a trough for each size, and rolls enough to fill the largest trough, are necessary. If the largest size is 15-inch or smaller, the No. 29 cutter will answer the purpose, but if the largest size is 16-inch or larger, the No. 39 is necessary. The number of rolls required may be determined from the table herewith, which shows the number necessary to fill each size and length of trough. Some operators prefer to have each trough supplied with a full set of rolls, thus avoiding the necessity of changing from one to the other, but such practice is unnecessary and is optional with the user.





Tile Formers

FOR handling the larger sizes of tile, especially when cut in plain roller troughs without the dumping attachment, these clamps or formers are used to considerable advantage. The figure at the right shows the former contracted ready for insertion into the tile, and at the left is shown the position of the leaves after the handles have been grasped to move the ware. It is hardly possible to handle double length tile with these clamps, but single length sizes up to 12-inch may be easily transferred from trough to truck or car. They are furnished for the 8, 9, 10, and 12 inch sizes.



No. 40 Hand Tile Cutter

WHEN the smaller sizes of drain tile are produced in limited quantities and an automatic cutter is not required, this simple hand cutter will be found a most satisfactory device. It cuts all sizes from 3 inch to 6 inch, inclusive, to any desired length between 13 and 14 inches, and is both rapid and accurate.

The trough of this cutter is supplied with a separate set of 22 rolls for each size of tile to be cut. These rolls are flannel covered, and are shaped to conform with the size of the tile so that a perfect support for the column is maintained. This feature is especially desirable when working tender clays or material which has to be temperd softer than usual.

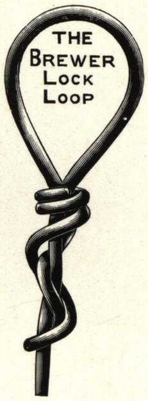
Two tile are cut off at a time, and both backward and forward movements of the cutting frame are used. The length of the end tile is determined by the stop or gate which is automatically lowered when the cut is completed to facilitate the removal of the ware after it is severed.

Weight without standards, 260 pounds. Weight of standards, 110 pounds. Length over all, 4 ft. 6 in. Orders should specify exact length of cut desired.

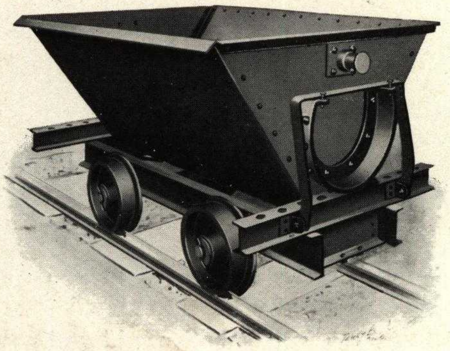
Cutting Wire

Brewer Brand Red Label Cutting Wire is selected quality from the best hard-drawn steel wires produced in the United States and foreign countries. Each lot is carefully tested for tensile strength, closely examined to determine uniformity of quality, and if not up to prescribed standard, is rejected. It is not offered as a cheap wire, but is sold as a good wire at a fair price with a guarantee of satisfaction, and every coil which does not prove satisfactory in every respect will be replaced with another without charge.

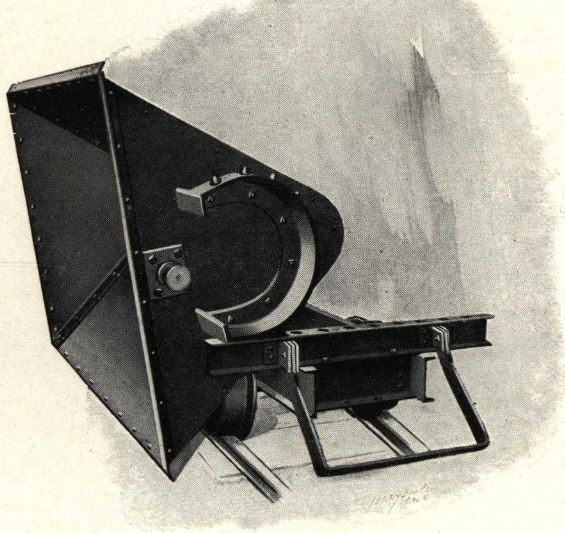
Made-up cutting wires with Brewer Lock Loop can be furnished promptly in any length and of any of the sizes specified below. They are twisted by automatic machinery, and are stronger and better than can be made by hand. They do not break in the loop and do not pull up tight around the wire holder hooks.



Brewer Brand Wire in one-pound coils is carried in stock in Nos. 8, 9, 10, 12, 14, and 15; carefully wrapped and covered with a preparation to prevent rusting.



Style 245
Carrying Position



Style 245
Dumping Position

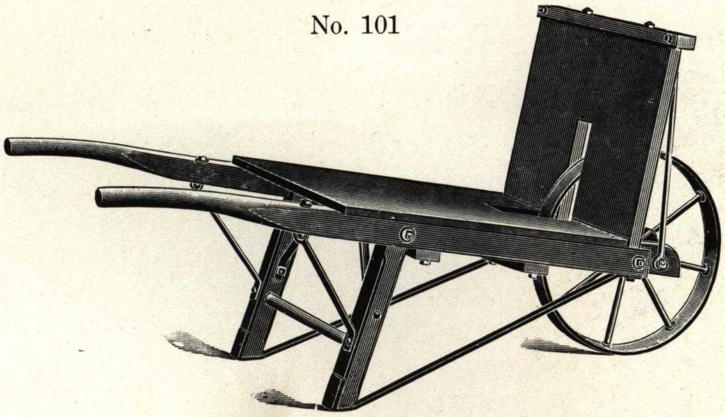
Style 245 Rocker Dump Clay Cars

This car is made with very low frame, perfectly balanced hopper, cold rolled steel axles, steel bushed wheels and roller bearings.

No. 1—Capacity ½ yd. Weight 700 pounds
No. 2—Capacity ¾ yd. Weight 950 pounds
No. 3—Capacity 1 yd. Weight 1,200 pounds
No. 4—Capacity 1½ yd. Weight 1,500 pounds
No. 5—Capacity 2 yd. Weight 1,800 pounds

Orders should always specify gauge of track.

No. 101



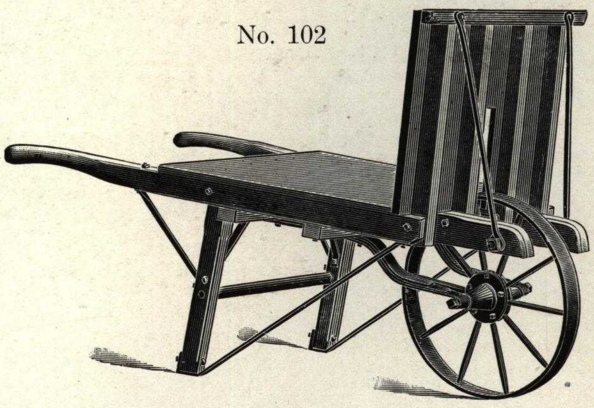
No. 101 Brick Barrow

Built in a substantial manner, from the best material. Handles 52 inches long; leg, 17 inches high. Bottom, 24 inches wide, 29 inches long. Dash, 24 inches wide, 19 inches high. Steel wheel, 19 inches diameter. Tire, 1¾ x ⅜ inches. Long iron leg braces, 1¾ x ⅜ inches, firmly bolted on, extend under ends of legs and fold up on front edge, serving as a shoe and adding much to the durability of the barrow. Weight, 70 pounds.

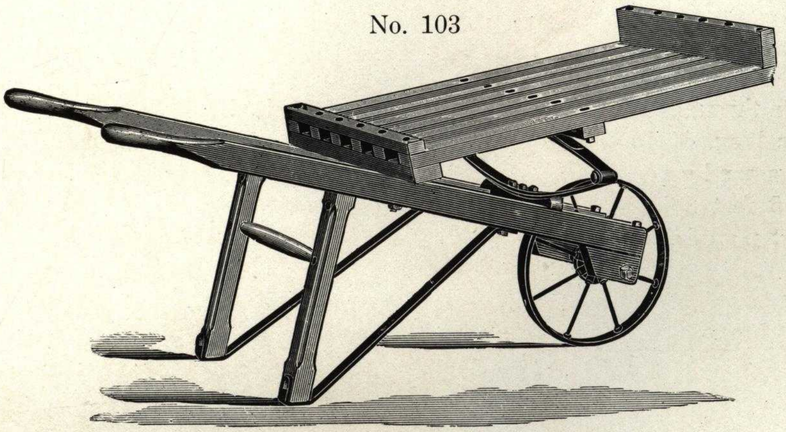
No. 102 Spring Brick Barrow

This barrow is similar to the No. 101, being the same size, except that the legs are longer. The wheel is attached to three-leaved open springs, as shown in cut. Patent steel wheel, 19 inches diameter. Tire, 1¾ x ⅜ inches. A first-class barrow in every respect, well made, strong, and durable. Weight, 75 pounds.

No. 102



No. 103



No. 103 Spring Truck

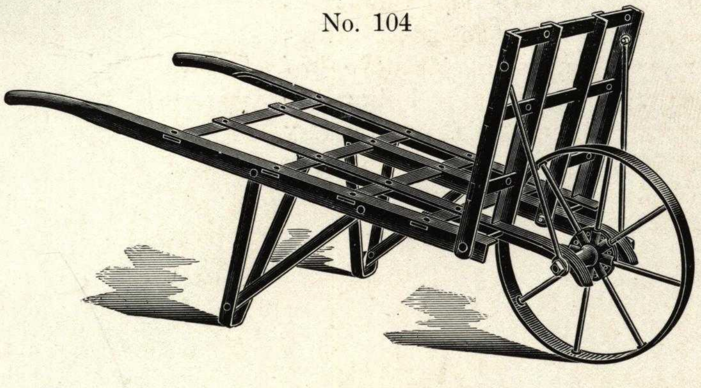
Off-Bearing

A strong, well-braced truck, made from the best seasoned timber. Platform or rack, 24 inches wide, 40 inches long. Strong two-leaved spring, 1½ x ¼ inches, 28 inches long. Patent wheel, 16½ inches in diameter. Tire, 1⅜ x ⅜ inches. Is preferred by many on account of the barrow shape of the handles. Weight, 74 pounds.

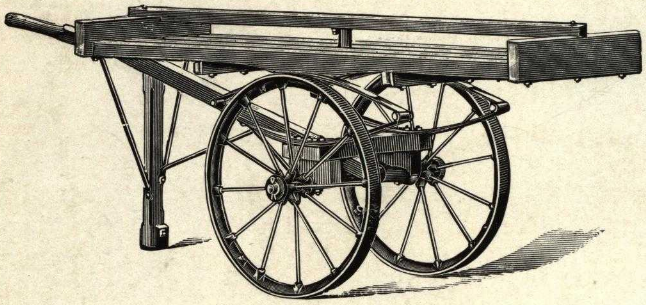
No. 104 Steel Brick Barrow

A strictly high-grade barrow, not affected by the weather. Handles of steel angles, 1¾ x ¼, 52 inches long. Wheel arms, bottom slats and dash, all of steel angles, 1½ x ¼ inches. Bottom, 23 inches wide at handhold, 20 inches wide at dash, 32 inches long. Dash, 20 inches wide, 18 inches high. Patent steel wheel, 19 inches diameter. Tire, 1¾ x ⅜. Weight, 92 pounds.

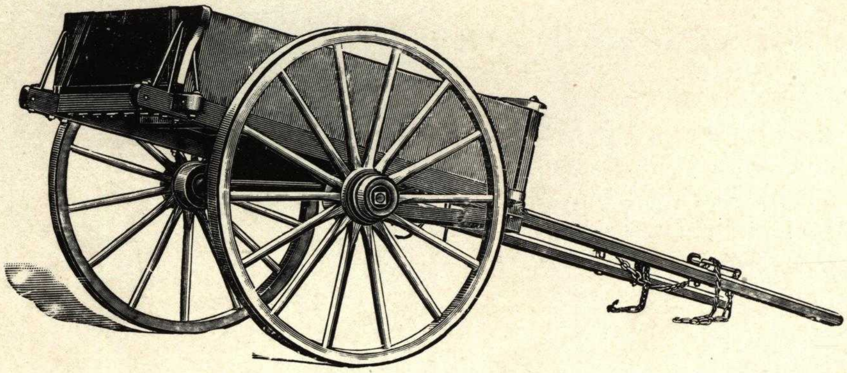
No. 104



No. 105 Spring Brick Truck



Platform, 18 x 63 inches. Slats, 1½ x ½ inches. Height of platform at leg, 25 inches; at front, 27 inches. Handle extends 25 inches in front of rack. Length over all, 90 inches. Staggered spoke wheels, 24 inches diameter, with extra wrought tire, 1¾ x ⅛ inches. Steel axle, 1⅛ inches square, with sand collar inside, and sand cap outside of wheels. Two heavy two-leaved springs, 28 inches long. Wheels bored and axles turned. All steel braces, 1½-inch round. Weight, 160 pounds.



No. 106 Dump Cart

Strong, substantial, and durable. Made throughout of best hardwood, strongly bolted and braced. Parts easily replaced when worn. Bed, 66 inches long, 44 inches wide, and 14 inches deep inside. Wheels, 54 inches diameter. Spokes, 2½ inches; best second-growth oak. Tire, 3 x ½ inches. Steel axle, 2¼ inches square. Wheels set standard wide track, 5 feet 2 inches. Supplied with chains and hooks, as shown in cut. Capacity, 24 cubic feet. Weight, 800 pounds.

No. 107 Spring Tile Truck

This truck is designed to carry tile from the machine to the drying sheds. It is supplied with a large platform, 28 x 72 inches, mounted upon double three-leaf elliptical springs, and has two wrought-iron wheels. It is a very satisfactory truck for tile, as it is steady and not easily upset.

Weight, 125 pounds.